Charlottetown Research Station 1909-1984

Agriculture Canada

Canada

HISTORICAL SERIES No. 19, available from
Director
Research Station
Research Branch, Agriculture Canada
P.O. Box 1210
Charlottetown, P.E.I.
C1A 7M8

© Minister of Supply and Services Canada 1984
Cat. No. A54-2/19E ISBN: 0-662-13294-7
Printed 1984

cover photo
Crop spraying as carried out in the 1930s.

Charlottetown Research Station 1909-1984

Mary B. Bourdon

Research Branch
Agriculture Canada

Historical Series No. 19
1984

Contents

Acknowledgments iv

Foreword 1

Chapter 1
The history of Prince Edward Island agriculture 3
- Topography 7
- Soils 7
- Climate 7

Chapter 2
The history of government involvement in agriculture 8

Chapter 3
Charlottetown Experimental Station—establishment and early years 10
- Appointment of first superintendent 10
- Cereals and other crops 12
- Horticultural work begins 13
- Livestock studies begin 14
- Egg-laying contests begin 14
- Crop rotations begin 14
- First barley variety developed 15

Chapter 4
The war years—1914–1918 16
- Dairy herd established 16
- Plant pathology laboratory established 17

Chapter 5
Years of continuing establishment—1919–1929 18
- Poultry program expands 20
- Illustration stations established 21
- Appointment of first supervisor 21
- Brown heart in turnip caused by deficiency 21
- Experimental farm growth continues 23
- Fire strikes dairy barn 23

Chapter 6
The depression years 25
- Forages receive increased emphasis 25

Chapter 7
World war II and beyond 27
- Soil laboratory starts 27
- Abegweit oat developed 27

Chapter 8
The postwar era brings new superintendent 28
- Dairy program aided 29
- Research aids cucumber industry 29
- Cereal program becomes regional responsibility 30

Chapter 9
Science Service Laboratory—1915–1959 32
- Plant pathology laboratory opens 32
- Laboratory acquires entomology unit 33
- Seed potato certification service helps industry 33
- Science service laboratory burns 34
- Starting over 34

Chapter 10
Charlottetown Experimental Farm–Science Service Laboratory merge—1959–1960 37

Chapter 11
Charlottetown Experimental Farm celebrates 50th anniversary 38

Chapter 12
The 1960s begin 39
- Amalgamation under way 39
- Two former Science Service Laboratory staff die 39
- York rutabaga released 39
- Dairy work continues 39
- Soil laboratory closes 39
- Tobacco program launched 39
- Apple testing phased out 40
- Poultry program ends 40
- Barley jointworm rearing technique developed 40
- Superintendent retires 41

Chapter 13
Appointment of first Director 42
Cabot oat developed 42
Spring wheat testing begins 42
Experimental fur ranch becomes station's responsibility 43
Comprehensive Development Plan introduced 43
Appointment of Dr. Glen C. Russell as Director, Harrow Research Station 43

Chapter 14
Charlottetown Reseach Station—1970–1983 44
New decade brings new director 44
Comprehensive Development Plan (CDP) 44
Agricultural Research and Extension Building built 45
Official opening ceremony 47
Costs shared 48
Branch decentralized 48
Dairy research center built 50
Research summary publication introduced 50
Prince Edward Island centennial projects 50
Charlottetown Research Station—the staff 50

Chapter 15
Cereal studies 52
Spring wheats developed 52
Winter cereals 52
Three barley varieties developed 52
Disease and pest control 52
Fertility and soil management 53

Chapter 16
Forage studies 54
Variety evaluation 54
Physiology of forage crops 55
Red clover breeding program initiated 55
Fertility and management 56
Pests and pest control 56

Chapter 17
Corn studies 58

Chapter 18
Vegetable studies 59
Pests and pest control 59

Chapter 19
Small-fruit studies 60

Chapter 20
Protein crop studies 61

Chapter 21
Tobacco studies 62

Chapter 22
Potato studies 63
Fertility and management 63
Pests and pest control 64

Chapter 23
Livestock studies 65
Feed evaluation 65
Weaning program developed 65
Computer modeling of livestock operations 65

Chapter 24
Ravenwood House—the Director's residence 66
Ravenwood House built 66

Chapter 25
Tree plantings 68
Tree plantings by royal visitors 69
Trees planted on the lawn of Ravenwood House 72
Tree planting site in centennial picnic-barbecue area 73
Trees planted in the picnic-barbecue area 73

Epilogue 74

Bibliography 75

Appendix I Land transactions 77
Appendix II Illustration stations 78
Appendix III Military service lists 79
Appendix IV Employee list 80

Acknowledgments

The preparation of this history has required the assistance of many people. It is not feasible to list all who have been involved, but the contributions of a number of individuals should be mentioned. When the preparation was initiated by Dr. Lloyd MacLeod almost 5 years ago, an outline was drawn up and Barrie Stanfield began to accumulate and compile information. He also interviewed two older staff members, Dave Schurman and Frank Tinney, who are now deceased. When Mary Bourdon joined our staff, she was assigned responsibility for this project and prepared a draft manuscript. The contribution of Robert Parent in documenting and advising on the earlier years, is most appreciated, as were contributions from Bruce MacLaren and Norman Black. Dr. Carl Willis contributed significantly to the editing of the manuscript. Others who have had significant input are Trevor Hansen, Dr. Jim Nicholson, Ernest Eaton, Ruth (Toombs) Baldwin, George Ayers, Fred Cannon, and Dr. David Weale. Numerous other individuals, including past and present staff and their families, have given generously of their time and effort, and their contributions are sincerely appreciated.

Foreword

Both the research station and the agricultural industry have grown and changed dramatically since the Charlottetown Experimental Farm was established in 1909. It is hoped that this history will accurately document the development of the research station, its staff, its research programs, and some of the accomplishments during the first 75 years.

Many people have labored with dedication on behalf of the research station throughout the 75-year period and have witnessed the growth and expansion of the station (see Employee list, Appendix IV). It is these people whom we wish to remember and whose contributions we wish to record briefly.

The development of the station is closely integrated with the development of the agricultural industry on Prince Edward Island and, as well, has been influenced by the development of the greater Charlottetown area. Over the years, staff of the station have been, and continue to be, prominently involved with producers, service industries, and processors, and also with community activities.

In addition to full-time employees, many people worked as casuals and summer students at the research station (formerly experimental farm and science service laboratory). Most enjoyed this experience and respected it as part of their growth and development in better serving the agricultural industry. It was also a good experience and developed an appreciation of agriculture for those who pursued nonagricultural careers.

Many factors, both internal and external, influenced the development of the research station and the agricultural industry on Prince Edward Island. We have tried to record some of these influences and relate them to the station's development. It has been a challenge, so many years after our institution was started, to get all the information and to document the growth and development of the station accurately.

Charlottetown Research Station has always been very visible and accessible not only to the agricultural community but also to the general public, a reputation of which we are most proud. Because of its location, originally outside the boundaries of the City of Charlottetown, and currently within the city limits, development of the research station has always been integrated with the City of Charlottetown and the greater Charlottetown area. Efforts to develop research station land for commercial purposes have been resisted over the years. This resistance is a credit to the various Directors and, in retrospect, it will be considered as a plus by future generations who will continue to enjoy this "bit of country" within the city. Although the primary mandate is service to agriculture, the public has come to appreciate the beautifully maintained grounds, and residents of the province, as well as visitors to the province, enjoy the beauty and tranquility of the research station.

The station has considerable historical significance with the planting of trees on the lawn of Ravenwood House by royalty, governors general, and other distinguished visitors and, more recently, with the establishment of a picnic–barbecue area and the planting there of trees by Premiers of the province and other distinguished individuals.

Like most institutions, the growth and development of the station have been influenced by periods of expansion and constraint. Charlottetown Research Station is probably unique in that its research staff and resources were increased by 25 percent during the 1970s as a part of the 15-year Prince Edward Island Comprehensive Development Plan (CDP), which was signed between the federal government and Prince Edward Island in 1969.

Prior to the CDP, provincial resources committed to servicing the agricultural industry were limited. Although dedicated, there were few provincial employees in agriculture. Farmers traditionally relied on, and looked to, the research station for technical assistance. The federal establishment responded with extension-oriented thrusts such as the illustration station concept and crop and animal field days at the station and throughout the province, which were both technical and social highlights. Many farmers relied heavily on and had direct contact with the research station. Today, even though there is still considerable involvement of research station staff with farmers for transfer and acceptance of technology, a greatly expanded provincial department of agriculture provides extension, technical, and veterinary services. Research station staff act as specialists and as backup to provincial staff in responding to producer enquiries, and the presence of both the federal and provincial departments in the new Agricultural Research and Extension Building makes this feasible.

Agricultural research has had many successes over the years, as evidenced by the success of the agricultural industry. These successes are, in truth, attributable to the past and present effects of research staff at establishments such as the Charlottetown Research Station. The general public probably does not fully realize many of the research contributions from Charlottetown Research Station because these contributions are incorporated into crop and animal production guides with little fanfare. Research is for the future and the programs at Charlottetown Research Station not only respond to the present needs of the industry but project the needs of the future.

Research accomplishments of this station are documented in detail in the scientific literature as well as in crop and animal production guides, bulletins, and press releases. It is not our intention to document all these achievements here—only to highlight the activities and developments over the years.

We hope this history will be perceived not only as a documentary record but also as a people-oriented development story, one that will be read with interest by a wide range of people including the general public, particularly those closely associated with the agricultural industry, and present and former staff and their families.

Many people have contributed to the preparation of this history and, although they have been duly acknowledged in another section, I reiterate my thanks to them. Their contributions have made the publication of this history an achievement of which we are proud and which future generations can refer to and enjoy.

L. B. MacLeod
Director

CHAPTER 1

The history of Prince Edward Island agriculture

The first European to sight Prince Edward Island was French explorer Jacques Cartier in 1534. Although visitors came and went from the Island for the next 180 years, the little French colony remained virtually unchanged for many decades.

The French called the newly claimed territory Isle Saint-Jean, or Island of St. John, and the lovely, wild land was destined to stay in France's grasp until 1763, the close of the Seven Years war. In that year, the Island was ceded to Britain. The Island of St. John kept its historic name until 1799, when it was changed to Prince Edward Island in honor of Edward, father of Queen Victoria.

Although under France's rule, the colony was mostly populated by nomadic Micmac Indians, who, it is assumed, stayed on the Island from spring until fall to hunt and fish, departing for their home in Nova Scotia when the cool weather came. Other part-time residents included French traders and fishermen who visited the Island during the remaining years of the sixteenth century and throughout the seventeenth century. These exploits did virtually nothing to change the appearance of the colony.

It was not until the beginning of the eighteenth century that the Island began undergoing a visible transformation. Acadian settlers, the first group to settle permanently on Isle Saint-Jean, came from Nova Scotia in 1720. These French-speaking people settled principally at Port La Joie on the southwest peninsula of Charlottetown Harbour. In addition to the Acadians, fishermen direct from France settled along the windy north coast of the Island in the area around St. Peters Bay. Rudimentary forms of cultivation were used by the settlers for the production of such crops as wheat and pea.

The population of Isle Saint-Jean grew slowly during the next three decades and centered around Charlottetown. Historians estimate that, at most, 400 ha of land were cleared for cultivation during this time.

Then, in 1758, the Acadians were expelled from the region by the British. Following this, many small tracts of land that the Acadians had cleared lay abandoned. These, as well as thousands of hectares of woodland, which had been altered by accidental burnings, represented a valuable commodity to settlers who were to come later.

At the conclusion of the Seven Years war in 1763, the British gained possession of 5200 km^2 of potentially good farmland on the Island. This land drew the rapt attention of many wealthy and powerful people who began to exert pressure on Britain. They eventually succeeded in convincing the Board of Commissioners and Plantations, the agency which administered the holdings, to divide the land into lots to be awarded to certain among them.

To implement this decision, Britain appointed Captain Samuel Holland to survey the Island in 1766. This survey divided the land into 67 lots and three townsites. Attached to each of the townsites was a royalty, a small area set aside for the support of the towns. Sixty-four of the lots were awarded by lottery ballots to favorites of the Crown, mostly British residents, at yearly rents ranging from two to six shillings per 40 ha. These were in turn rented to farmers. Except for swamp, barren lands, and small clearings left by the banished Acadians, the entire Island remained under heavy forest. It is probable that the appraised values Captain Holland applied to the lots were based largely upon their natural drainage and vegetation patterns. What has since proved to be highest quality farmland had been forested with pure and mixed stands of sugar maple, white maple, white birch, red oak, white spruce, red spruce, balsam fir, and hemlock. Good stands of white pine and red pine were found chiefly on the lighter soils. Cedar was limited to areas where there was considerable lime in the subsoil.

The remaining three lots were given to the King and to certain fishing companies that had established fishing stations on these properties years earlier.

above
Mechanized threshing mill

opposite page • above
Loading hay into barn

opposite page • below
Pulling competitions were popular events on Prince Edward Island.

In return for the grant of the original 64 lots, each of which could be either sold or leased to tenant farmers, the lot holder was to fulfill, within a decade, certain conditions regarding the types and numbers of settlers he could allow to use his land. These conditions were not followed and Britain did not police the agreement. Most lot holders held onto their land in speculation. They hoped that as their neighbors improved their holdings, their own lots would inflate in value without any effort or expense incurred. This resulted in an exceptionally slow rate of land development. The system of lots ended in 1875 when, after Prince Edward Island entered Confederation, Canada purchased those tracts remaining in the hands of proprietors and resold them to the settlers. Islanders were unhappy with this absentee ownership and annual rentals and are, to this day, very sensitive regarding land ownership.

Between the period when lots were surveyed in the 1760s and a century later, the Island's land had virtually all been cleared and settled. Farming, the main occupation of settlers, was primitive. Crops most commonly grown during this period were oats, potatoes, hay, and barley. At the same time, the Island was experiencing a rapid population increase. When the first census was taken on the Island in 1825, there was a population of 23 000. These included Acadians, Scots, English, and Irish. By 1881, the population reached 109 000.

By the beginning of the nineteenth century, plows made of wood but with an iron point were used. Harrows were also constructed of wood and had iron teeth. Prior to the introduction of manufactured harrows, beechwood boughs were used to smooth the land between the stumps and to cover grain and grass seed.

The first patches of grain planted among the tree stumps were harvested by using a reaping hook, or sickle. This took a good deal of time and effort. Next, a device called the cradle, a scythe with rake attachment, was introduced. The reaper became available about 1875 and binders soon after. After the grain was harvested, the common method of threshing was by flail. The flail was an ingenious gadget constructed from two hardwood sticks measuring about 1.3 m long and 2.5 cm thick, fastened together by a leather thong on a swivel. The sheaves of grain were placed on a wooden floor or other hard surface and flailed. When grain was threshed by this method, it was subsequently cleaned by tossing in the wind.

Fanners for cleaning grain came into being at around the same time as the powered thresher. A Prince Edward Island firm founded in 1861 by Thomas Hall was, in fact, one of the pioneers in the construction of threshing machines. The Hall thresher, as it was called, became known throughout Canada by the late nineteenth and early twentieth centuries. Before the invention of the gasoline-powered engine, small threshing machines powered by horses on treadmills were in common use.

Potatoes have been grown on Prince Edward Island since its settlement, and in answer to the onslaught of the potato beetle, the Hunter Potato Bug Picker was patented and produced at Dundas, P.E.I., in 1894. The device consisted of two paddles and a catching pan mounted on a single wheel. It was pushed by hand, like a wheelbarrow, between the rows. The bugs were knocked from the leaves onto the pan and then destroyed. These machines were very popular for a time, and today are displayed in local museums.

Vast quantities of oats and hay were shipped to Britain and the United States during the nineteenth century. These rapidly expanding markets proved to be catalysts to growth. Islanders capitalized on the lumber cleared from the land either by selling the raw material or by crafting it into sailing vessels, which sold for premium prices on the open market. However, crops continued to be cultivated on these fields with little or no effort made to refertilize the depleted soil. Agricultural societies began springing up at this time to promote good land husbandry, but many farmers did not heed the advice given.

Also during the early to mid-1800s, a large influx of Irish immigrants arrived, coming to the Island either directly from Ireland or indirectly via Newfoundland. They settled in this area to make better lives for themselves and their families. Since most of the Island's useful land had been taken by this time, the Irish were forced to settle in the marginal land areas. In any event, they were, in most instances, so poor that even if good farmland had been available, they would not have been able to lease it.

Between 1840 and the mid-1860s, USA was the Island's major buyer of agricultural goods. In fact, the United States purchased over 40 percent of the Island's export crops in an average trade year. United States markets diminished when that country abolished certain trade agreements it had held with Canada. Britain then became the Island's major customer.

In 1873, Prince Edward Island entered Confederation. Prior to and for more than a decade after joining Canada, Prince Edward Island's agricultural production remained at a high point, both in terms of volume and profitability. Lumbering and shipbuilding continued brisk trades, and exports of many types of goods continued to rise. By the 1870s, the Island had reached a state of relative economic prosperity that it would not witness again for nearly a century.

Around 1890, some farmers from the western part of the province began raising foxes in captivity. The silver fox fur industry grew slowly at first, but soon live pairs of breeding foxes were selling for up to $35 000. The market continued to expand and prosper for decades, turning some farmers into millionaires almost overnight.

Also around 1890, the Island had developed a reputation for its fine-quality draft horses, which were exported to the Atlantic region and the United States, resulting in good returns to breeders. A member of the Royal Agricultural Society said in 1852 that the Island was, indeed, the perfect spot to raise good horses: *"Our climate and soil seem peculiarly adapted to the breeding of horses. They are here subject to few diseases. Our dry soil furnishes a short but sweet pasture . . . the young horse therefore acquires a robust constitution and early maturity."*

The sale of these horses continued briskly until about 1920.

But, just before the turn of the century, the Island started losing economic ground. Western Canadian grain growers began to sell their products at prices so much lower than could growers in Prince Edward Island, that exports of Island grain fell sharply. Forests, by that time stripped of valuable timber for the construction of sailing vessels and for lumber, were of little economic importance. The wooden sailing vessels, which continued to be manufactured, were considered obsolete. At this same time, there was practically no unused farmland left, and the Canadian West was experiencing a land-grant rush, which

lured Islanders away. Island manufacturers went out of business when huge factories in central Canada and the United States offered goods at cheaper prices. Many of the men and women who had been working in these small Island industries migrated to the New England area, setting up new households in the big cities and small textile towns there. Between 1891 and 1921, the population of Prince Edward Island declined from 109 000 to 88 000, a real loss of 19 percent.

During the last years of the nineteenth century, many of the farmers of Prince Edward Island started small dairy enterprises; mixed operations that often included some potato and hay production. Dairy farming helped fill the gap caused by the grain market falling to Western Canadian competition. Small cheese and butter factories began to spring up in many parts of the province. Dairying was considered a wise alternative for Prince Edward Island farmers at this time because it provided a steady source of farm income. As well, it relied on both hay and pasture production. These crop forms are well suited to the province's cool, moist climate. A by-product of dairying was skim milk, a livestock feed that is beneficial to most animals. The cream was made into butter and cheese for export to the mainland. From an economic viewpoint, dairy farming was superior to both beef and sheep farming, because it produced a high per-unit income. This, needless to say, was important for farmers with limited hectarage, as was usually the case in Prince Edward Island. Beef production did not enjoy much popularity at this time, because it was more land and capital intensive than most farmers could consider. In later years, however, more farmers turned to beef production. Although beef did not seem economically worthwhile for the province, hogs were a perfectly acceptable enterprise. There were two main reasons for this: hogs provided a thrifty outlet for feed grains and skim milk, and they converted these feedstuffs into land-enriching manure.

The sheep industry, which had experienced a reasonable level of growth in the province, began to decline in 1881 when the number of head peaked at 166 000. This decline in the sheep industry continued through the years, rising again only recently. This recent rise corresponds with the increase in potato production and the crop rotations necessary to grow feed for dairy and beef cattle on these potato operations.

Potato production on the Island as well as the levels of potato exports continued to rise until the 1890s when the increasing cost of production forced many farmers to cut back. This decreased production remained fairly steady at approximately 75 percent of the 1890 figure until 1920 when potato area under production on Prince Edward Island nearly doubled. The increased area was centered principally in the southeastern Prince County area. Growers witnessed a 300 percent increase in production. More land under cultivation and the introduction of two new higher-yielding varieties, Irish Cobbler and Green Mountain, were responsible for this increase. Seed potatoes were produced for export starting in 1918. This marked the beginning of an industry that has continued to grow until this very day.

Apple orcharding on a commercial basis was not given consideration by many rural Islanders until the latter part of the 1800s. In 1897, the Fruit Growers' Association of Prince Edward Island was formed to promote the development of this enterprise. These pioneers were able to show that high-quality apples could be grown on Prince Edward Island, contrary to the generally held belief that the climate was not suitable for the growing of apple trees. Island apples took prizes at European fruit exhibits in Paris, 1900, and in Glasgow, 1901.

The province's Department of Agriculture, at the outset of its establishment in 1901, began to promote apple growing as a worthwhile enterprise, and started orchards in different parts of the province in 1902. These orchards were established in addition to a model orchard at the provincial farm. In the province, hundreds of orchards, totaling about 2000 ha, were planted at the turn of the century. Approximately 100 000 other fruit trees, chiefly plum, pear, and sour cherry, were also planted.

Tobacco was first grown on the Island in 1959. In that year, 7 ha of flue-cured tobacco were grown on a provincial government-owned farm in the eastern part of the province. Numbers of farmers from Ontario settled in the area and began growing the crop with reasonably good results. In the fall of 1967, the Imperial Tobacco Company purchased land for tobacco production in the Glen Martin area. This encouraged many farmers, both local and Ontario-based, to start growing the crop on the Island.

Dairy farming has come a long way since the introduction of milking operations in the late nineteenth century. Production has, on the average, increased steadily. Sales of industrial milk take up the bulk of trade, with cream sales a close second. Fluid production is far below both industrial and cream types.

As is the situation nearly everywhere in Canada, farming in Prince Edward Island has taken on a larger and more complex face during the past three decades. Increased mechanization, the accompanying move to larger operations, new marketing methods, and the increased mobility of goods and services have contributed to agriculture, changing its scope and, ultimately, its contribution to the economy of the province.

The Island is one of the Atlantic region's foremost agricultural areas, possessing a higher proportion of high-quality farmland than any other province in the region. Islanders take farming very seriously, too. The natural resources on Prince Edward Island combine to form a delicate, easily changed environment. When farmers make use of these resources to their optimum advantage, the opportunities are seemingly endless. The result of their efforts has been the production of top-quality food. Food enough to feed not only themselves, but their neighbors and many other people, as well.

right
Prince Edward Island has a higher proportion of high-quality farmland than any other province in the region.

opposite page
Much of the Island's best farmland was cleared to maximize its use. As a result, cold winds that sweep down from northern Quebec often blow unrestricted.

Topography

Prince Edward Island is almost trisected by deep bays and a tidal river. The coastline, approximately 1600 km long, is indented by numerous bays and estuaries. It is characterized along the south coast by many long headlands and shore cliffs of red sandstone capped by a reddish overburden of till. Along the north coast, it is marked by narrow stretches of sand dunes and broad, sandy beaches.

The surface relief map of the Island indicates a predominantly flat to moderately undulating plain consisting of smooth slopes. The change in gradient varies from 1 to 25 percent. Usually the curves of the land are long, low, and wide, but in some locations they appear as long ridges. Much of the Island is less than 45 m above sea level. There are only two locations on Prince Edward Island where the land reached 150 m above sea level.

Soils

The soil type occupying 95 percent of the area on Prince Edward Island is classed as glacial till. The other 5 percent includes an assortment of types, consisting of organic soils, water-laid soils, and dune sands.

The natural fertility of the Island's soils, of the Podzol group, is of low order. In most of the province, the principal agricultural soils are developed from material derived mainly from reddish sandstone, soft red shale, and pebbly conglomerates.

These parent materials have given rise to soils that for the most part have a relatively permeable profile and low clay content. As well, they have a low content of bases and other plant nutrients and are strongly acidic, thus providing low natural fertility. With additions of fertilizer, however, they can be very productive. These soils, covering about 525 000 ha, include all the variations in profile associated with local geological materials. They have, however, many features in common. They all show the profile characteristics of podzol development and some similarity in the sequence and color of horizons. In *Soil Survey of Prince Edward Island*, published in 1950, G. B. Whiteside divides the glacial till soils of Prince Edward Island into nine series, giving each a name as follows: Charlottetown, Alberry, Pownal, Haliburton, Culloden, Armadale, O'Leary, Egmont, and Queens. The first six are medium-textured, and the remaining three are moderately heavy soils. The two series derived from water-worked parent material have been called Dunstaffnage and Kildare. During the past 10 years, the Island has been surveyed more thoroughly and a report is being finalized.

The Charlottetown and Alberry series are the most extensive. The surface soils in these series vary from fine to very fine sandy loam. Other series occupying considerable hectarages are the O'Leary soils, which vary from fine sandy loams to clay loams, and the Culloden series, a sandy loam with loose, porous subsoils.

Over 50 percent of the total surface area of Prince Edward Island is well suited to the production of crops commonly grown in the region. The rest is composed of roads, ponds, streams, and marginal or submarginal land.

Field studies have shown that the virgin thickness of the Island's surface soil was about 20 cm on much of the land now cultivated. However, the present average thickness measures 12 cm, and in certain cases only 10 cm. This indicates that, during the period of the land's cultivation, a considerable amount of the surface soil has eroded.

Other equally obvious evidences of the erosion that has occurred and is still taking place are the denuded, impoverished hillsides as well as severe gullying in some areas. Large rich deposits of fertile soil at the base of slopes, on flat areas along small bodies of water, and in salt marshes near estuaries were often formed by fine topsoils that had been washed down from higher land. Silt deposits in rivers, streams, and harbors where dredging is needed to keep channels open also indicate a problem of soil erosion.

Climate

The climate of Prince Edward Island is not as mild as might be expected. The cold Labrador current of the North Atlantic and the cold winds that sweep down from the interior of northern Quebec normally result in relatively cold winters and late springs.

The summer's heat is tempered by marine conditions; temperatures topping 30°C are uncommon.

Gale force winds are frequent and may occur at any time. The average monthly wind velocity ranges from 12 to 23 km/hour. As is to be expected, the higher monthly wind speed averages occur during the spring, fall, and winter. Prevailing winds are from the west and northeast in winter, from the north in April, and from the south and southwest during the summer and fall.

The Island's frost-free period is 154 days (73-year average, 1910–1982), and the 73-year average monthly mean temperatures range from a low of −7.6°C in February to a high of 18.9°C in July. The highest temperature ever recorded was 37°C in August 1935. The lowest was −31°C in January 1923.

CHAPTER 2

The history of government involvement in agriculture

The history of government involvement in agriculture in Canada has been a long and diverse one. In order to present a history of the research station at Charlottetown, it is appropriate to review some of the major historical events leading up to and following the development of the Canada Department of Agriculture.

Prior to Confederation, a Bureau of Agriculture functioned in the Province of Canada under a minister. It was generally felt, however, that this Bureau was not responding adequately to the provinces' growing agricultural needs. In 1868, Parliament passed an Act for the Organization of the Department of Agriculture. The Act called for the department to be placed under the guidance of a minister and a deputy minister. When the department first began, it was concerned not with agriculture alone; it also supervised public health, censuses, and patents. Later, the responsibilities for these areas were absorbed by other government departments.

The agricultural work of the department during the early years dealt mainly with livestock health. Concerns such as the control and cure of diseases already present in Canadian livestock and the prevention of new diseases by careful inspection of ports of entry were attended to.

As Confederation grew larger in both size and population (with the entrance of the Northwest Territories in 1868, Manitoba in 1870, British Columbia in 1871, and Prince Edward Island in 1873), the need for expansion of departmental activities to serve these differing agricultural areas became obvious. The diversity of soil and climatic conditions in these regions presented many obstacles to farming and much could be done to improve agriculture, Canada's economic backbone.

To examine how Canadian agriculture could be improved, a Select Committee of the House of Commons was appointed in 1884. One of the first recommendations put forth by this Committee called for the establishment of an experimental farm. One year later a London, Ont., professor, William Saunders of Northwestern University, was recruited to investigate the matter. His report, issued the following year, gave an overview of the experimental station system in the United States, and recommended a similar system for Canada. The report was presented to the House of Commons by Canada's Minister of Agriculture, the Honourable Sir John Carling. As a result, an Act permitting the establishment of five experimental farms was passed that year. Dr. Saunders, who was by then well-acquainted with the experimental farm system, was appointed first Director of the new organization, called the Experimental Farms Branch. Three years later, Dr. Saunders purchased land to accommodate the Central Experimental Farm on the outskirts of Ottawa and branch farms at Nappan, N.S.; Brandon, Man.; Indian Head, N.W.T. (later Saskatchewan); and Agassiz, B.C. The purpose of these farms was to do experimental work regarding livestock breeding, dairying, field husbandry, horticulture, and entomology, and to pinpoint methods, breeds, and varieties most suitable for the different regions of Canada. Information obtained from these experiments was published in bulletin form for distribution to farmers.

The department instituted branches to oversee work in many areas of agriculture. As agriculture expanded and Western Canada opened up for farming in the first years of this century, the activities of the department grew along with them. In 1906, the federal government approved the establishment of a new farm, then termed an Experimental Station, at Lethbridge, Alta. Alberta was the site for the establishment of two more stations immediately following the Lethbridge installation. One was built at Lacombe in 1907 and another at Fort Vermillion the following year. In 1909, another was set up in Rosthern, Sask. Eastern Canadian farmers might very well have felt neglected by this time, had it not been for the establishment of the Charlottetown Experimental Station in 1909 and another facility at Kentville, N.S., the following year.

By the time Experimental Farms Branch celebrated its 50th anniversary in June 1936, it had grown rapidly. There were, within the branch, 33 experimental stations and farms, 14 substations, 11 branch laboratories, and 233 illustration stations. Fourteen hundred personnel were employed by the branch, which had extended its operations from east to west and from north to south of Canada.

The nature of agriculture is a complex, diverse one. For this reason, research in agriculture is difficult to coordinate. The department has reorganized itself on several occasions during this century. One notable such endeavor took place in 1937, when the department's branch-style structure was replaced by grouping services on a functional basis. The department's responsibilities were broken down into five services, each headed by a Director. Marketing Service had responsibility for all areas of marketing, grading, and economics. Production Service included health of animals, plant protection, plant products, and other production areas. Experimental Farms Service took the place of Experimental Farms Branch, and certain sections of the Central Experimental Farm were transferred to Science Service, which encompassed animal pathology, botany, plant pathology, entomology, bacteriology, and chemistry. Experimental Farms Service now included 10 of its former 13 divisions: Animal Husbandry, Bee, Cereal, Fibre, Forage Plants, Field Husbandry, Horticulture, Illustration Stations, Poultry, and Tobacco. As well, there was Administrative Service.

In 1950, Science Service, in an effort to make a more vital and lasting contribution to Canadian agriculture, was expanded. This service became involved in an intensive laboratory construction program in Ottawa and throughout Canada. In many instances these facilities were located beside experimental stations, but were responsible for their own distinct programs and administration. The scientific research done in these new facilities was often considered innovative and of vital importance to Canadian agriculture.

The period just before, during, and following World War II, was one of great change, growth, and advancement within the department. Science was entering every aspect of Canadian life, including agriculture. Rapid technological advances were turning the very nature of farming around. In 1959, the department was again reorganized, this time into three branches. These new branches included Research, Production and Marketing, and Administration. The first two were administered by a Director General and were responsible to an Assistant Deputy Minister. Later, Administration Branch became two separate branches, Financial Administration and Personnel Administration. At that time, Economics Branch and Health of Animals Branch were recreated.

Research Branch combined the former Experimental Farms Service and the Science Service into one establishment. This new entity included research institutes, research stations, branch farms, and regional laboratories. At many establishments, units and research programs merged. In Ottawa, senior scientists formed a program directorate to help in the coordination of agricultural research.

In 1978, the Department again underwent reorganization which, when it was finally completed in 1980, meant the decentralization of all branches in order to give greater responsibility to Canada's diverse regions. The five branches included Research, Food Production and Inspection, Marketing and Economics, Regional Development and International Affairs, and Finance and Administration. Each of these branches had an Assistant Deputy Minister who reported to the Deputy Minister of Agriculture. The move to decentralization did not end there, however. The area within Research Branch that was previously called Eastern Region was divided into two—Quebec Region and Atlantic Region.

CHAPTER 3

Charlottetown Experimental Station—establishment and early years

above
Ravenwood House as it appeared in the 1890s. This house was located on the property leased to the Dominion Department of Agriculture in 1909 to establish an experimental station in Prince Edward Island.

above right
J. Artemus Clark, Superintendent, 1909–1947

In 1901, the government of Prince Edward Island established a Department of Agriculture. At this time, a provincial farm was being operated at Falconwood, near Charlottetown. Besides raising and selling livestock, the farm had also become involved to a limited extent in crop experimentation. Realizing that local sources of revenue were too low to support an extensive experimental program, provincial authorities soon asked the federal government to assume responsibility for the farm and operate it as an experimental station. The federal government refused the request, however, because the farm's location was not considered suitable.

In 1909, the provincial government chose a more suitable piece of land, purchased it for $5700, and leased the property on a long-term basis to the Dominion Department of Agriculture. This site was located just north of downtown Charlottetown.

The land, 11.9 ha, and a stately but dilapidated 10-room mansion called Ravenwood, were collectively known as the Pope property, a namesake of its former owners. This was followed, in 1910, by the purchase of four smaller properties, which the provincial government conveyed to the Dominion Department of Agriculture. These included the Chandler property—2.5 ha, the Gay property—0.9 ha, the Blake property—6.0 ha, and the Johnson property—2.0 ha. These land parcels, when added to the Pope property, gave the experimental station a total of 23.3 ha. In these purchases, the federal government reimbursed the province for the 23.3 ha at the rate of $125/ha (for more information on land purchases, see Land transactions, Appendix I).

The experimental station has operated at the original site since establishment in 1909. Throughout the years, the experimental station has been known as Charlottetown Experimental Farm and will be referred to as such hereafter.

Appointment of first superintendent

In 1909, the Dominion Department of Agriculture appointed Mr. J. Artemus Clark as the first Superintendent of Charlottetown Experimental Farm. The enthusiastic young Superintendent's first task was to hire a staff to repair buildings and prepare land for cropping the following year.

That first fall, Dr. William Saunders, Director of Dominion Experimental Farms, recognized the beauty and potential of the 10-room Ravenwood House, and instructed that it be repaired and used as the Superintendent's residence. Mr. Clark lived in Charlottetown while the repairs were being made. One room of the house was reserved for an office and was used as such until 1924. Another room was set

aside as a guest room for the use of senior officials from Ottawa who visited the farm. The room was used for this purpose until 1960.

During renovations to Ravenwood, Dr. Saunders found it necessary to remind Artemus Clark that reasonable economy should be exercised, as is indicated in the letter from William Saunders to Artemus Clark, reproduced here.

October 15, 1909

Dear Mr. Clark:
Your package of vouchers were duly received this morning.

Everything is satisfactory excepting one item—you have paid rather an extravagant price for your office chair, $10.75. The most expensive chairs we have at the offices here are the Felting chairs which are charged at $7.75 each. I should not have authorized this $10.75 if it had been referred to me but since it has been bought I suppose we must let it pass although if it gets known it will bring me some criticism.

I trust you will in future in such cases exercise reasonable economy and if at any time you are in doubt please refer the matter to me.

Yours truly,

Saunders

P.S. When further supplies are required for the office, please refer the estimates of cost to me before ordering them.

The largest barn on the property was repaired, but it was concluded that the remaining outbuildings were of little value. Plans were made to construct more suitable buildings to replace them.

All the cleared land (7.7 ha) on the Pope property was broken in the autumn of 1909. Trees were cut, swamplands cleared, and wood chopped for kindling. A drainage well was sunk in the swamp and a silt basin built.

There were three ponds located near the old barn when the property was acquired. They had been dug to obtain clay for pottery and brickmaking. Two of these ponds were eventually filled in. The third was converted to a lily pond, thanks to the creative foresight of Dr. Saunders, who came upon the idea that a lily pond would be a "natural" for the Charlottetown Experimental Farm. When he recognized this, William Saunders wrote to a dealer in Kentucky for plants to be delivered to the farm early in 1910. The lily rootstalks were established and, after a few problems with insects, began to thrive, attracting countless visitors to the farm. By 1920, the pond was completely covered with lily leaves and blooms. To this day the pond blossoms, a tribute to the keen perception of Dr. Saunders.

Weather observation was also an occupation of the Charlottetown Experimental Farm. In August 1909, meteorological instruments were taken from a weather observatory at Bayview, P.E.I., and set up at the farm. These were Artemus Clark's own instruments; he had been a weather observer and kept records. To these instruments a sunshine recorder was added which, when mounted on the cupola at the Superintendent's residence, recorded, on cards, valuable meteorological information. Every evening at sunset the cards were replaced. Monthly summaries of these and other weather data for Prince Edward Island were sent to the Central Experimental Farm in Ottawa. This service has, over the decades, continued—although methods of, and parameters for, collecting weather information have become increasingly complex.

The following is a typical report for June in those early years:

Report for the

Census and Statistics Monthly

Month of June, 1909

June has been a month of moderate temperatures. A fair share of rain during the first day and the third week. The early grain has made a splendid growth and shows a very rich color. The last week being dry hastened the ripening of the berries and they may not prove as heavy as were anticipated. All fruit has set well and gives promise of a heavy crop. Many reports have come in from the country of injury from the cutworm among fruits and vegetables.

Corn was late germinating but at the close of the month was improving rapidly.

On the 19th of June, the maximum temperature of 79°F[26°C]was reached while the minimum of 34.5°F[2°C]was recorded on June 4th. The mean temperature for the month was 58.575°F[14.5°C], with 2.91 inches [74 mm]of precipitation and 220.7 actual hours of sunshine.

Very truly yours,

J. A. Clark

Superintendent

right
Residents of Marshfield, P.E.I., gather at the Experimental Farm's lily pond for their annual picnic in 1915. The Experimental Farm was frequently used for community gatherings.

Cereals and other crops

At the turn of the century and for several decades, many Prince Edward Island farmers grew their own wheat for flour. So, from the beginning of the Charlottetown Experimental Farm's work in cereal testing, hard red spring wheat was the subject of serious experimentation. Also during this period, oats were considered much more important than they are today, because they were feedstuffs for horses. In addition, some gristmills were equipped to make oatmeal from dry oats. For these reasons the farm, from its beginning, undertook experimentation in a wide variety of such crops. Many new seed varieties were shipped here from the central farm headquarters in Ottawa.

Corn, clovers, and grasses were also investigated carefully to determine which varieties would be best suited to Prince Edward Island's cool, moist climate and various soil types. Those varieties of cereals, grasses, clovers, and corn that proved especially suitable for growth in the region were multiplied on larger areas and sold to farmers throughout the province. The farmers would then grow more of these valuable varieties for widespread seed distribution. This system was implemented to allow all Prince Edward Island farmers access to successful plant varieties. Each year, August was set aside to allow interested members of the public to view the plants in an advanced stage of growth. In 1910, corn was first grown for silage at the farm, and variety trials were conducted. Forages such as mangels, sugar beets, turnips, and carrots were also tested. Yield trials were conducted on two varieties of timothy, and a number of alfalfa plots were seeded to test alfalfa's persistence when seeded with other crops including wheat, barley, and oats.

above left

Apple variety testing was done at Charlottetown for 50 years. During early times, tripod ladders were used by apple pickers.

center

The spray program played a major role in the success of the apple research program.

below left

Early farm staff photo. *From left*: Thomas Meickle, John Trainor, Henry Callbeck, Murdoch MacLennan, Norman MacLeod, Everett Hogan, Artemus Clark, and William Hires.

As well, alfalfa was grown in Prince Edward Island beginning in 1910. Three seedings were made that year on well-cultivated sandy loam, and a yield of 3985 kg/ha of alfalfa was reported. Mr. Clark later wrote, ". . . while alfalfa is not believed to be as satisfactory a forage crop on P.E.I. as red clover, yet the farmers have received this information and have been saved the loss of having their fields bare. Many strains of alfalfa and other clovers have been tested over the year, and the hardiest recommended. Among the grasses, timothy stands in first place for hay and orchardgrass and meadow fescue have shown that they are promising grasses for pasture."

In 1912, the experimental farm sent out on request 54, 2.3-kg lots of alfalfa seed, enough for limited use in nearly every township on Prince Edward Island, and sufficient amounts of inoculated soil from the farm's established alfalfa fields. Six new lots of alfalfa seeded at the farm that year overwintered well. Grimm, the alfalfa variety seeded, had a widespreading root system, which resulted in less spring heaving than was experienced with certain other alfalfa varieties, and much higher yields, as well. In these early times at the farm, Artemus Clark cited the problems associated with growing alfalfa in the province. One was the abovementioned spring heaving, which he said could be lessened or overcome by proper drainage, use of homegrown seed, the early rolling of fields, and the growing of variegated alfalfa. The second problem was that hardy natural grasses were crowding out alfalfa plants, even after they were established. He suggested two things: thorough, clean cultivation before seeding, and the use of a disk harrow run at a slight angle after each cutting. These, said Clark, were the "best remedies known."

Horticultural work begins

From the beginning, horticultural crops received their share of attention, with work designed largely by the Dominion Horticulturist and the Superintendent. In 1910, 100 fruit trees and more than 1000 ornamental shrubs were sent from the central farm, Ottawa, to Charlottetown for planting on the farm property. Mr. Clark took great interest in the property's appearance, and made certain that it was kept tidy and attractive. Flowers were considered by many to be the farm's most attractive feature. Hundreds of the choicest tulips, narcissi, irises, roses, and dahlias made their appearance annually.

Many named apples were evaluated each year, beginning in 1910. Eight were eventually considered regionally suitable: Melba (Red), Hume, Joyce, MacIntosh (Red), Lobo, Cortland, Delicious (Red), and Sandow. Plums, pears, and cherries were also tested for regional suitability. These orcharding ventures quickly attracted the attention of farmers and also their wives, who took a sincere interest in the growth of these orchard varieties. The farm was a convenient visiting spot for farmers and their wives, who often took the train that ran through the farm property.

Strawberry variety testing got under way at Charlottetown in 1910, when 21 varieties were planted. The following year, 25 more types came under scrutiny. Many of the strawberry varieties sent from Ottawa were destroyed by worm infestation; however, the local varieties resisted this worm infestation.

In addition to strawberries, many varieties of raspberries, blackberries, gooseberries, and dewberries were grown. These specimens grew well and attracted much attention. Their progress was attributed largely to the suitability of Prince Edward Island's soil and climate for small-fruit production.

Starting early in 1911, a complete system of horticultural recordkeeping was begun. Artemus Clark described the process in detail: "Every tree, shrub, vegetable and flower is examined from time to time throughout the year and notes recorded giving annual growth, hardiness, general condition, diseases and other items . . . the dates the flowers open, their period of full bloom and when the bloom is over."

In 1911, Mr. Clark reported that the well and 6000 m of underground field tile, which had just been installed, had removed all the surface water surrounding them. These tile drains are believed to be the first ever installed in Prince Edward Island. A set of Fairbanks scales, which had been supplied from the central farm at Ottawa, was installed. Galvanized iron pipe was laid to carry city water to the house and barn.

In 1911, possession was taken of a small triangular portion of property situated on the west side of the railway, and a crossing was installed over the railway. The area measured 0.6 ha. This brought the total area of the experimental farm to approximately 24 ha.

Sections of the farm had been well husbanded and were ready to be used for experimental purposes. These sections included the Chandler and Gay properties, which were seeded with clover during the autumn of 1909. However, the greater part of the Pope property, which was by far the largest parcel of land leased to the Dominion, was in very poor condition. The land had been overcropped without being manured, and weeds had gained the upper hand. Notwithstanding, most of the property was composed of sandy loam, a soil typical to Prince Edward Island. For this reason it was suitable for experimental purposes. The remaining land was also representative in soil composition, some requiring improved drainage, and most needing systematic upgrading of soil composition. These tasks spelled much work ahead.

One of the first full-time employees at the farm was Mr. Murdoch MacLennan, who was appointed Farm Foreman in 1911. He supervised several excellent teamsters and hourly-rated employees. These were flexible, capable men with the talents required to perform almost any farm task plus the skills required to perform general office work. The office skills were essential to the smooth operation of the farm, because no secretarial staff had been hired. Daily journals, painstakingly kept, tell the story of hard work, planning, and determination, coupled with thrift and vision, qualities which helped get the Charlottetown Experimental Farm off to a good start, turning it into a real and working institution.

The year 1911 saw much construction and renovation. An outbuilding located near the Superintendent's house was moved and converted into a carriage house/workshop. A stable was built in the largest barn. A new machine house, a barn, and a foreman's house were also constructed on the property. These buildings were prominently placed to the south of a picturesque shelterbelt of hardwoods and young conifers.

A daily journal from the year 1912 indicates that there was considerable activity but with a very small staff. Carpentry tended to be time-consuming. Repairs to Ravenwood House and the building of a sheep barn were under way. The time spent harvesting and grading grain, weighing lambs, cleaning harness, hauling manure, repairing tools, and doing general field work were also recorded. Visitors on a typical day numbered between two and 20, and records of these were also carefully recorded in the daily journal.

Livestock studies begin

As it was originally conceived, Charlottetown Experimental Farm was not intended for livestock research. On the contrary, only enough stock was to be kept to operate the station efficiently, using up roughages and other surplus products that resulted from the investigational work with cereals and garden crops. In 1911, experimental work with sheep began with 30 lambs purchased that year. These animals were divided into three groups and fed a uniform grain ration comprising different roughages, including alfalfa hay and oat straw, corn stover, timothy hay, and roots. A letter penned by Mr. Clark to Dr. J. H. Grisdale, Director of the Dominion Experimental Farms, dated 24 June 1911, explains why he wished a change in program policy:

"In view of the fact that many thousand lambs are exported every year from this province and that a very small number of them are really in first class condition for marketing, I think it would be very desirable to carry on some experimental work with both sheep and lambs to determine what gain might be expected from two or three month feedings on a fattening ration, roughage that accumulates in the autumn about every farmstead and particularly about the Experimental Farm."

Sheep studies concluded in 1917. From then on, sheep promotion in Prince Edward Island was left entirely to the Production and Marketing Branch of the Dominion Department of Agriculture and the provincial Department of Agriculture.

Steer-feeding experiments, which were under way at Charlottetown in 1912, were concerned almost entirely with winter-feeding trials. Animals were selected and purchased in early fall, pastured for a short time as a preliminary to actual feeding tests, checked for tuberculosis, and dehorned. Then feeding tests began. At the conclusion of each feeding experiment the steers were sold at public auction.

During those early days, steers were dehorned in a less aesthetic manner than is employed today. A pamphlet, issued several years after the feeding trials began, entitled *Steer feeding experiments in Prince Edward Island 1912–1922* states that only one dehorning method was employed at Charlottetown during that 10-year period.

". . . the steers are thrown with a rope, three half-hitches being placed around the body. The animals are securely tied, and the horns removed with a fine-toothed meat saw held as close to the head as possible. Observation tends to the conclusion that bleeding is very considerably less if the horn is cut close to the head. Cold water is used to check the flow of blood, and the steer is released and allowed to get on his feet almost immediately."

During that era, dehorning was still an uncommon procedure. The steer-feeding pamphlet went on to explain that it was virtually impossible to fatten steers with the horns on without tying the animals up, because they would probably injure one another.

A further conclusion from the steer-feeding studies was that raising steers on Prince Edward Island made sense for the following reasons: it provided manure necessary to promote soil fertility; it was economical; and it allowed for the even distribution of farm labor throughout the year. The pamphlet offered recommendations on breed selection, the keeping of dry cows, the use of homegrown feeds, and the selection of efficiently designed buildings.

The establishment of a dairy herd for research purposes was delayed by the lack of farmland for pasture and growing feed and the need for adequate animal housing. However, in 1912, one grade Guernsey cow was kept to supply milk to staff.

Poultry breeding began officially in 1913, when 120 barred Plymouth Rock eggs were placed in incubation and a small flock resulted. New construction dealt with poultry housing requirements. Work was devoted mainly to the production of a uniform egg-laying strain of barred Plymouth Rocks and single-combed White Leghorns. Only hens with a record of 150 eggs, or more, per year were kept for breeding purposes.

Egg-laying contests begin

To further the egg-laying experimentation, in 1918 Prince Edward Island was selected as the site of the nation's first Egg-laying contests for the Dominion Department of Agriculture. This was the first concerted, sustained educational and practical effort on experimental farms in Canada to improve the general quality of laying-poultry production in Canada. In order to conduct these contests, 10 additional poultry houses and 160 birds were included in the program. Each poultry breeder selected eight pullets that were sent to the experimental farm, where they were observed and their performances recorded. The most productive layers were eligible for registration in the federal government record of performance.

Charlottetown Experimental Farm first housed swine in 1918 when six sows were purchased. In 1919, an experiment in feeding wheat screenings to pigs over 2 months old was conducted.

Crop rotations begin

As previously mentioned, farming was at a low ebb in the early 1900s, with heavy cropping resulting in sales of large quantities of potatoes, grain, and hay. This intensive cropping resulted in a rapid loss of soil fertility. In response to this soil fertility loss, a series of crop rotations was done at the farm, starting in 1912. In that year, six rotations were established on 7 ha under a plan suited for public demonstration. These included 3-, 4-, 5-, and 7-year rotations. The results of these experiments were recorded carefully and made available to the farm community through publications and press releases. The rotations were designed to be applied to mixed

farming operations where livestock was an important part of the farm plan and manure was applied at some point in the rotation, supplemented by commercial fertilizers and limestone. Rotation studies were continued with slight variations for several decades.

First barley variety developed

In 1912, Mr. Clark selected a variety of barley from the province's north shore area, originally called Old Island Two-Rowed, later to be named Charlottetown No. 80. This variety quickly became one of the most popular grains grown in the Maritimes. The grain, which had been brought to Prince Edward Island from England by the early settlers, probably found its origins in English Chevalier. Natural crosses appear to have occurred over the centuries, because several fairly distinct types were selected from the original seed. These were experimented with for several years and the experimentation soon led to the discarding of other strains. Of the characteristics which set this two-rowed, awned barley apart from other varieties, the most outstanding was that the majority of its awns were shed at harvesttime, leaving the spikes practically bald. It outyielded all other varieties under test by a significant percentage, and was tolerant of acid soils; therefore it grew well in Prince Edward Island. Mr. James E. Murphy of Augustine Cove, P.E.I., one of the province's outstanding pure seed growers at that time, nicknamed Charlottetown No. 80 "The farmer's barley." Registered on 6 April 1916, Charlottetown No. 80 became certified soon after.

By 1912, more than 200 plots of vegetables and roots were under cultivation. Most were common species, but, to the surprise of many, eggplants, parsley, peppers, and watermelons were grown—no simple feat under the cool climatic conditions of Prince Edward Island. As the 1912 experimental farm guide states: "The garden has proved to be of great interest to visitors and much valuable and interesting information has been gained from it."

Getting useful information to farmers when they need it has never been easy. Informing farmers of research completed during the year seems to have been as much a consideration to Mr. Clark in 1912 as it is to research stations today. A letter from the Superintendent to the Director of the Dominion Experimental Farms in Ottawa gives the reader a clear indication of this:

March 21, 1912

Mr. J. H. Grisdale
Director
Dominion Experimental Farms
Ottawa, Ontario
Canada

Dear Sir:

. . . I think it very important that information sent out to the farmers should be fresh and new, and not the result of work they know was done a year or more ago. The farmer wants the information along his line of work just as fresh and "down to the minute" as the stock broker . . . . I regret to say that in my experience the reports and bulletins sent out to farmers have in many cases proved to be more bother to the housewives at housecleaning time than any real help to the men they were sent to.

J. A. Clark

Superintendent

In 1912, Clark initiated a custom at the farm that is still popular today: the planting of trees by royalty and other dignitaries. For more information, see Chapter 25, Tree plantings.

By 1914, Artemus Clark decided there was sufficient need for expansion in poultry work. He requested that experimental colony houses, rearing houses, fencing, and coops be built to accommodate them—including the 563 chickens hatched that year. Despite this increase in stock, 1914 was considered an unfavorable year for incubation. Throughout the decade, poultry production continued to increase. Two varieties of birds—the barred Plymouth Rock and the White Leghorn—were tested.

In 1913, an apiary was started at the farm with five colonies placed in Mr. Clark's residence in December. The bee cellar was well ventilated, had a cement floor, and was held at a fairly constant temperature of 8°C. The colonies all came out strong in the spring of 1914 and were placed in the apiary yard in April.

above
Bees were recognized for their importance in crop pollination from earliest years. By 1925, many beehives were kept at the farm.

CHAPTER 4

The war years—1914–1918

above
The "farmerettes"

From the beginning of Canadian involvement in World War I, work at the farm fell behind when many hourly-rated employees served in the military (see Military service list, Appendix III), and funds were cut back severely. In fact, so many of the province's farm laborers left to serve in the forces that it was difficult to find anyone to do the farm's work. Programs and activities suffered. So, in the summer of 1917–1918, high school girls, nicknamed farmerettes, were hired to do farm work that ordinarily would have been performed by hourly-rated laborers who were now serving in the military. Chores included hoeing, weeding, and planting crops. Under supervision, the farmerettes completed important tasks that might otherwise not have been done.

To a limited extent, building projects continued during World War I despite the severe budget cutbacks necessitated by the war effort. These included a dairy barn and poultry housing. In 1914, the station acquired the eastern 2.8 ha of the Johnson property, bringing the farm's total land area to 26.7 ha, a figure which remained stationary for more than a decade.

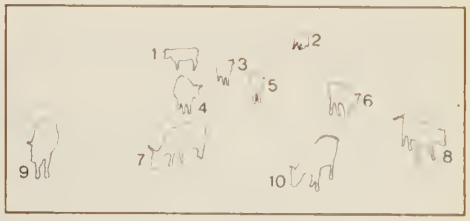
Dairy herd established

A beginning was made in establishing a herd of Ayrshire dairy cattle at the farm in 1915, when Island Queen of Spruce Row and Lady Petunia of Spruce Row were purchased from Easter Brothers, East Royalty, P.E.I. During the next few years, cows were purchased from the following Prince Edward Island residents: S. R. Cairns, Freetown; John Carr, Winsloe; Charles Robinson, Marshfield; Edwin Reid, Rollo Bay; William A. White, Rollo Bay; and Tupper Ferguson, Marshfield.

The 12 cattle purchased were top-quality stock from the best breeders on the Island. The Ayrshire breed was selected because it was the most prominent breed in the province. One bull, Ottawa Ivanhoe, was secured from the Central Experimental Farm, Ottawa, in 1919. He produced many qualified progeny.

To house the new herd, a barn was built in 1916. By 1922, a fairly creditable herd had been established—so good, in fact, that the experimental farm joined with three other Island breeders in showing 40 head of Ayrshire cattle at the first Royal Agricultural Fair in Toronto. There were 412 Ayrshire cattle shown at the exhibition and the farm won seventh place for a 2-year-old bull, and sixth place for a 2-year-old heifer in milk, in very strong classes. From time to time, some cattle were shown at local and regional exhibitions, but the practice was eventually discontinued when it was felt that this was not the herd's main purpose.

For several decades, the herd was kept primarily for the purpose of supplying breeding stock to Prince Edward Island farmers. In addition, records of feeding and milk production were carefully kept and evaluated to demonstrate the economics of the dairy enterprise. The herd was also used in cooperation with Health of Animals Branch, to secure information in connection with the elimination of tuberculosis and brucellosis. It was tested tuberculosis free from 1922 and brucellosis free from 1929.



above left

1. Daisy of Sunnyslope
2. Buttercup of Sunnyslope
3. Ravenwood Buttercup
4. Buttercup of Glenholm
5. Lily of Melrose
6. Ravenwood Lily
7. Jean of Craggan
8. Cora of Craggan
9. Ravenwood Milkmaid
10. Ravenwood Victoria

above left

Photo taken in 1923 by Canadian National Railway photographer situated on an old toboggan slide in pasture field south of the new road. Men in photo are CNR employees, including P. Clarkin (with back to camera).

below left

The Experimental Farm had access to traveling exhibits, which were prepared by the Department in Ottawa and shipped ready to display. Here an exhibit is mounted at the main Exhibition Hall, Charlottetown, P.E.I., c. 1916.

Plant pathology laboratory established

In 1915, a plant pathology laboratory was opened in Prince Edward Island to conduct research on plant diseases (for more information, see Chapter 9, Science service laboratory—1915–1959).

In 1915, a series of fertilizer experiments was started at Charlottetown Experimental Farm, in cooperation with the Chemistry Division of the Central Experimental Farm in Ottawa, to determine how to maximize profits from the use of commercial fertilizers. Experiments were conducted with potatoes and included barnyard manure alone and in combination with commercial fertilizers. In 1916, tests to determine maximum profits from the use of commercial fertilizers were extended to include a study of differing sources of nitrogen and phosphorus. As well, studies on the value of fertilizer produced from seaweed were begun. These experiments were done under the direction of Mr. Clark, assisted by Farm Foreman Murdoch MacLennan and skilled hourly-rated employees.

It is interesting to note that no experiments were conducted at the experimental farm on mussel mud, even though it was common practice to apply mussel mud to agricultural land in Prince Edward Island

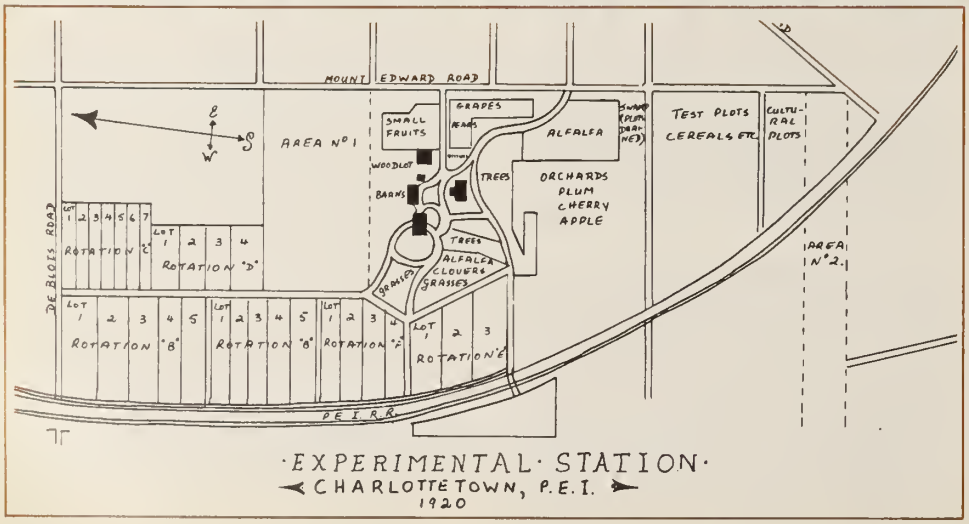
In September 1918, Miss Edith Sterns was hired as a stenographer. Miss Sterns brought to the office a measure of continuity and precision, making the task of operating the establishment much easier. Also in 1918, Mr. Dave C. Schurman was hired as Assistant Poultryman. This was a busy time for the poultry section of the station, because the Egg-laying contests project was being established and much effort was required to get the contests under way.

Mr. George Brown, an old-time country gardener, came to the farm in 1918 as an hourly-rated employee. Mr. Brown was a highly esteemed employee who took pride in knowing not only the common names but also the scientific names of flowers, vegetables, and shrubs grown under his care. He carefully established and cultivated permanent and perennial flower borders, keeping them in high bloom for extended periods of time.

In 1919, Mr. R. D. Lindsey Bligh was named Acting Superintendent while Artemus Clark went overseas to head the agricultural section of Khaki College, England, a school for soldiers returning from the war. Mr. Clark returned to Charlottetown the following year.

CHAPTER 5

Years of continuing establishment—1919–1929



In 1919–1920, the farm was recovering from the effects of World War I, with its restricted funds and manpower that imposed curtailment of many projects and plans. Funds were found to construct an office building, complete with a concrete basement and record storage vault. This is now the Horticulture Building. The facility was formally opened by His Honour Lieutenant Governor Murdock McKinnon. Delegates from the Dairymen's Association, the Central Farmers' Institute, the Prince Edward Island Egg and Poultry Association, and the general public gathered for the opening.

Mr. Clark gave a guided tour of the building, and people were shown an exhibit illustrating the many projects at the farm. He described the new building as part of an enlarged program that included more stock, more buildings, and more land. The office building was considered to be well-appointed for its day, and boasted a number of facilities including a Superintendent's Office.

In December 1919, Mr. James Spiers became the first herdsman for the Charlottetown Experimental Farm but remained for only 18 months. His position was refilled in 1922 when Mr. Frank Roper was hired on an hourly-rated basis. In 1919, Dave C. Schurman was named Poultryman, taking the place of Mr. Joe G. Morgan. Dave Schurman, like Joe Morgan, worked under the general direction of Artemus Clark, who took special interest in initiating and promoting the Egg-laying contests project. More egg-laying contest houses were constructed that year.

In addition to the many hourly-rated employees at the farm during those early years, agricultural students worked during the summers to broaden their experience and earn money to continue their studies.

Mr. B. Frank Tinney was appointed first Assistant Superintendent in 1920. For many years he was Mr. Clark's right-hand man, assisting in the preparation of estimates, writing annual reports, drawing up

above left
The office building that was constructed in 1920. It is now known as the Horticulture Building.

center
Staff, Charlottetown Experimental Farm, c. 1920

below left
The Charlottetown Experimental Farm, 1920

building plans, supervising livestock projects, and so on. Twice Frank Tinney was made Acting Superintendent, but these opportunities came several years later. In the meantime, he was called upon to oversee or conduct a myriad of projects and experiments, which he accomplished with a level of skill unusual for his years. From early times onward, he was the farm's resident photographer.

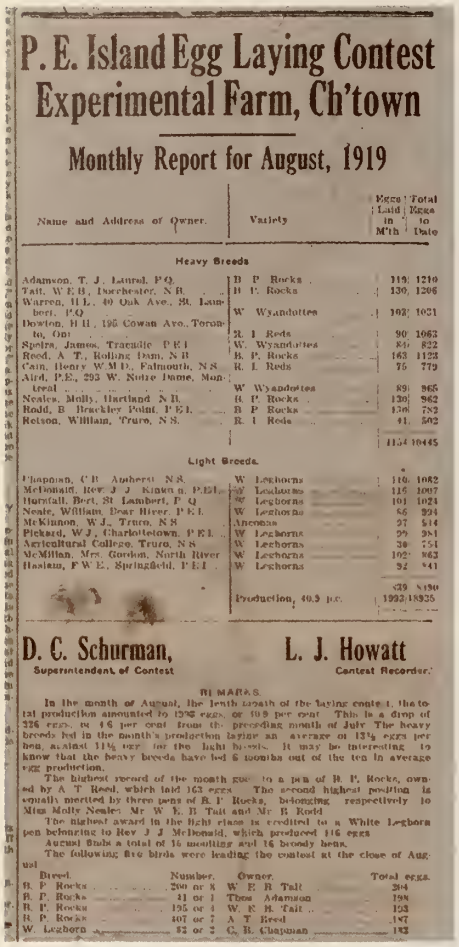
The year 1920 saw more buildings constructed. Projects included a wagon shed and the conversion of the carriage house into a modern dairy with a small steam plant. A tool house and a mixing shed were built east of the dairy, Blake House, a residence for workers, was remodeled, some renovations were made to Ravenwood House, and more egg-laying contest houses were built. For the next 5 years, no other construction took place at the experimental farm.

In 1921, the first car was purchased by the farm. It was driven only by Mr. Clark, and the Model-T, with its hand crank, hand-controlled gas and spark, was considered an exciting addition. The vehicle, however, was very sensitive to rough road conditions. One day when Mr. Clark was driving back to the farm from Summerside, P.E.I., he struck a large pothole. Mr. Clark, a heavy man, applied the brakes with all the force he could muster. The pedal dropped to the floorboards. The engine had broken loose from the frame and was hanging precariously. There was no one nearby to help, so he pried up the engine and fastened it in place with wire. When he reached Charlottetown, he drove to the nearest garage. The machinist identified the problem, fetched some small iron clips, and bolted them on to secure the engine. Artemus Clark mused later, "Henry Ford knew that was going to happen and even had the bolt holes bored already."

above right
Blake House, a residence for workers at the Experimental Farm, was remodeled in 1920.

center
Although the Experimental Farm purchased its first tractor (the Moline Universal D shown here) in 1920, horses were used for many farm tasks until the late 1930s.

below right
The first car purchased by the Experimental Farm was this Model T Ford in 1921.



P. E. Island Egg Laying Contest
Experimental Farm, Ch'town
Monthly Report for August, 1919

Name and Address of Owner.	Variety	Eggs Laid in M'th	Total Eggs to Date
Heavy Breeds			
Adamson, T. J., Laurel, P.Q.	B. P. Rocks	119	1210
Tait, W. E. B., Dorchester, N.B.	B. P. Rocks	130	1206
Warren, H. L., 40 Oak Ave., St. Lambert, P.Q.	W. Wyandottes	103	1021
Dowton, H. H., 195 Cowan Ave., Toronto, Ont.	S. C. Reds	90	1062
Speirs, James, Tracadie, P.E.I.	W. Wyandottes	85	822
Reed, A. T., Rolling Dam, N.B.	B. P. Rocks	163	1123
Cain, Henry W.M.D., Falmouth, N.S.	R. I. Reds	75	779
Aird, P.E., 295 W. Notre Dame, Montreal	W. Wyandottes	89	865
Neales, Molly, Hartland, N.B.	B. P. Rocks	130	982
Rodd, B. Beachley Point, P.E.I.	B. P. Rocks	136	782
Nelson, William, Truro, N.S.	R. I. Reds	41	502
		1154	10445
Light Breeds.			
Chapman, C.B., Amherst, N.S.	W. Leghorns	116	1082
McDonald, Rev. J. J., Kinkora, P.E.I.	W. Leghorns	116	1007
Turnbull, Bert, St. Lambert, P.Q.	W. Leghorns	101	1024
Neale, William, Bear River, P.E.I.	W. Leghorns	66	994
McKinnon, W.J., Truro, N.S.	Anconas	97	814
Pickard, W.J., Charlottetown, P.E.I.	W. Leghorns	99	981
Agricultural College, Truro, N.S.	W. Leghorns	30	754
McMillan, Mrs. Gordon, North River	W. Leghorns	105	942
Haslam, F.W.E., Springfield, P.E.I.	W. Leghorns	92	841
		639	8190
	Production, 40.9 p.c.	1993	18935

D. C. Schurman, Superintendent of Contest

L. J. Howatt Contest Recorder.

REMARKS.

In the month of August, the tenth month of the laying contest, the total production amounted to 1795 eggs, or 40.9 per cent. This is a drop of 326 eggs, or 4.6 per cent from the preceding month of July. The heavy breeds led in the month's production laying an average of 13½ eggs per hen, against 11½ eggs for the light breeds. It may be interesting to know that the heavy breeds have led 6 months out of the ten in average egg production.

The highest record of the month goes to a pen of B. P. Rocks, owned by A. T. Reed, which laid 163 eggs. The second highest position is equally merited by three pens of B. P. Rocks, belonging respectively to Miss Molly Neales, Mr. W. E. B. Tait and Mr. B. Rodd.

The highest award in the light class is credited to a White Leghorn pen belonging to Rev. J. J. McDonald, which produced 116 eggs.

August finds a total of 16 moulting and 16 broody hens.

The following five birds were leading the contest at the close of August:

Breed.	Number.	Owner.	Total eggs.
B. P. Rocks	200 or 8	W. E. B. Tait	204
B. P. Rocks	31 or 1	Thos. Adamson	198
B. P. Rocks	195 or 4	W. E. B. Tait	153
B. P. Rocks	107 or 2	A. T. Reed	147
W. Leghorn	52 or 2	C. B. Chapman	132

above

Egg-laying contest report, The Guardian (Charlottetown)

above right

Potato growers' picnic, July 1924

opposite page • above

Illustration station field days were useful and interesting events both for farmers and for research officers. A well-attended field day was held at the Rustico Station in 1934.

opposite page • below

Brown heart in turnip

In 1920, the provincial government passed the Act for the Prevention of Infections and Contagious Diseases of Bees. Mr. Warren Burns, Apiarist for the Experimental Farm, was appointed Provincial Bee Inspector under the Act. He made two inspections of each apiary in the province and found only four diseased apiaries. These were located in the same area and measures were taken to eliminate the problem.

In 1920–1921, a small herd of purebred yorkshire pigs was maintained to study problems relative to successful swine breeding and to offer good stock to young producers.

In 1921, sunflowers were added to the list of forage crops tested at the farm. Also featured in forage studies were various grass–clover mixtures, and yield and persistence studies on clover and timothy. The following year a stave silo was constructed. It was filled with sunflowers and corn.

Poultry program expands

Between 1919 and 1925, poultry continued to get much attention at the farm. Work continued to be devoted mainly to the production of a uniform egg-laying strain of barred Plymouth Rocks and single-combed White Leghorns. The Egg-laying contests project, which was one of Superintendent Clark's main responsibilities, attracted entries from many parts of Canada. Contest results were published every month in the local daily newspaper, as illustrated by the following reproduction of the report for August 1919, which appeared in the Guardian newspaper of Charlottetown.

By 1923, poultryman Dave Schurman had assured the success of the national Egg-laying contests and all other poultry work at the farm. In 1924, he was placed in charge of horticultural and cultural records at the farm. At this point, Mr. Fred Driscoll became responsible for poultry work. In 1923, Frank Tinney went to Macdonald College on educational leave and when he returned to the farm in 1924 he was placed in charge of poultry work. In this capacity, he supervised Fred Driscoll and other poultry staff. In 1924, Dave Schurman was awarded the Macdonald College Scholarship for Prince Edward Island. In 1925, he returned from Macdonald College to become Assistant Superintendent in charge of Field Husbandry and Forage Crops at Charlottetown.

Between 1925–1929, the poultry staff continued working to improve genetics within the flock. Birds producing small eggs were culled and a study was instituted to determine the cost of rearing chicks to 5 months of age.

Poultry work continued to expand. Feeding experiments were conducted to determine whether commercial mash or the homemade variety was superior. The Egg-laying contests continued, gaining in national importance, and attracting entrants from all regions of Canada. These contests concluded in 1928.

Illustration stations established

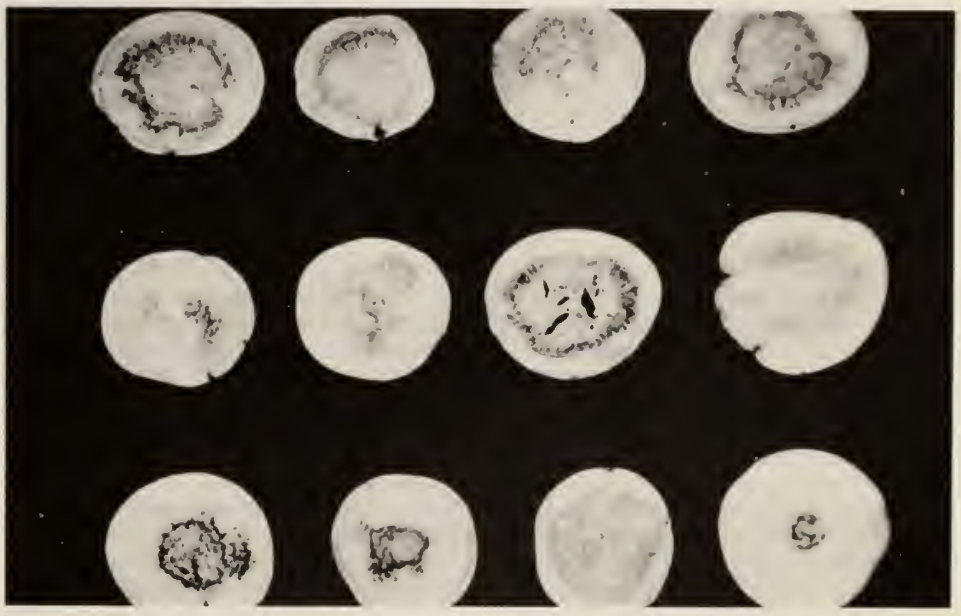
Six illustration stations, privately owned farms where the owner-operator cooperated under contract with experimental stations or farms to do agricultural projects, were established in 1923 by Artemus Clark and John Fixter, Chief Supervisor, Illustration Stations, Ottawa. One of the first undertakings of this program was to establish a definite rotation of crops in a field easily visible from the highway to give the public an opportunity to see the experiments being conducted. On experimental facilities across Canada, crop rotation proved essential to profitable crop production, and John Fixter was determined that this principle be well demonstrated on the Prince Edward Island illustration stations. There was no official supervisor of illustration stations during the first 4 years of their operation in Prince Edward Island, and work accomplished was minimal.

Appointment of first supervisor

Mr. Robert C. Parent was appointed the first full-time Supervisor, Prince Edward Island Illustration Stations, in May 1927.

During the next few years, illustration stations were established on a regular basis in all areas of the province. When Robert Parent began supervising illustration stations, a program of fertilizer experiments was undertaken with approval of the illustration stations headquarters in Ottawa. Commercial fertilizers were already being used extensively by potato farmers. To help overcome the problems that the overuse of fertilizers was creating, many experiments were conducted to determine the most economical combination of nitrogen, phosphoric acid, and potash, and the most practical rates per hectare. After 10 years of research, a 1-2-2 ratio of nitrogen, phosphoric acid, and potash was established. In later years, as a result of soil analyses, this formula was modified to suit different locations and crop requirements.

Illustration stations were not only ideal for complementing the work of the central farm but were also useful for making the results available to the public. The principal method adopted was the holding of field days, when neighboring farmers were invited to the station. These events were held in cooperation with the provincial Department of Agriculture. Talks and demonstrations were given by officials of the provincial department as well as Charlottetown Experimental Farm and other federal Department of Agriculture personnel. The most important and interesting part of a field day was a visit to the field experiments, where farmers were able to see firsthand the results of the research being conducted. In the field, farmers asked questions freely, and told of their problems and experiences. The research officers found the illustration station field days useful to explain the results of their experiments to the farmers. It was a good experience for everyone and a true testing ground, but care was needed to keep the talks on a practical level. Over the years, field days were exceptionally well attended. In fact, during the first 10 years, 100 field days were held, with a total attendance of more than 10 000 visitors.



Brown heart in turnip caused by deficiency

In 1928, due to the serious prevalence of brown heart in turnip crops grown in the Maritimes, the Dominion Botanist, through the Charlottetown Plant Pathology Laboratory, organized an intensive study of this problem. In 1933, a committee was established by the department to examine diseases of turnips in Eastern Canada, under the chairmanship of Dr. E. S. Archibald, Director, Dominion Experimental Farms Branch. The Maritime committee, which cooperated with the national body, was headed by Mr. C. F. Bailey, Superintendent, Fredericton Experimental Station.

right

Operators of illustration stations, 1956. *From left*: T. Albert Hicken (Alliston), James E. Daly (Iona), Hugh J. MacDonald (Monticello), William E. Johnstone (New London), Robert Woodside (O'Leary), John W. MacKenzie (Rose Valley), and Zenon Gallant (Urbainville). Mr. Daly's contract ended in 1952. Missing from photograph are Heber and Lester Profitt (Alberton), and Edward Bouffard and Alberic Lapierre (Magdalen Islands, Que.).

opposite page

The dairy barn built in 1924 was destroyed by fire in 1928.

In cooperation with these committees, an experiment was done in 1933, using six different treatments to control brown heart at 10 illustration stations on the Island. Treatments in the experiment included barnyard manure, commercial fertilizer, ground limestone, sulfur, salt, and borax (boron) in various combinations. One hundred and twenty plots of 0.01 ha each were used. At harvest, 100 turnips from each plot were sliced and examined to determine the severity of the disease in the roots. Mr. Hurst of the Plant Pathology Laboratory assisted Mr. Parent and staff of the illustration stations in tabulating and interpreting the information. Mr. Hurst photographed many specimens from all treatments and locations. The results of this experiment, which were published in the Annual Report issued by the farm, showed clearly that when plots received 11.2 kg/ha of borax in combination with barnyard manure and fertilizer, brown heart was satisfactorily controlled. Shortly after the results of the 1933 experiment in Prince Edward Island on brown heart were reported in the Annual Report and in the American Potato Journal, an Island fertilizer manufacturer and distributor, the Island Fertilizer Company, introduced a turnip fertilizer mixture that included borax. Fertilizer mixtures containing boron are still used as the principal means of controlling brown heart in turnips wherever they are grown. In 1934, Messrs. MacLeod and Howatt of Fredericton Experimental Station reported in their closing sentence of an abstract titled, "Soil treatment in the control of certain soil-borne diseases of potatoes," published in the *American Potato Journal*, that soil treatment with sodium tetraborate controlled brown heart in turnip.* In 1936, as a follow-up to earlier investigations, Mr. Hurst was senior author of *Turnip brown heart*, a paper he wrote with Mr. D. J. MacLeod of the Fredericton Experimental Station.

After 10 years as Illustration Station Supervisor for Prince Edward Island, Robert Parent was transferred to New Brunswick where he assumed the position of Supervisor, Illustration Stations. In May 1937, Mr. Ernest Eaton was appointed Illustration Station Supervisor for Prince Edward Island. He carried on the work for the next 3 years, and was then transferred to the Kentville Experimental Station.

When Ernest Eaton arrived at Charlottetown, the various supervisors of illustration stations were responsible to the Superintendent as well as to the Division Chief, Illustration Stations. Mr. Eaton first met Dr. Clark at Wolfville, N.S., in 1929, when the Superintendent was being granted his honorary doctor's degree from Acadia University. Says Ernest Eaton: "By chance, I was near enough to be the first to congratulate him, and we later had a standing joke as to which he appreciated more, the degree or my handshake?"

Under Mr. Eaton's direction, a new illustration station was established in 1937 at East Point, P.E.I., where special work was conducted with upland cranberry production. This station was established to help answer some of the questions plaguing the Island's cranberry industry, which seemed braced for increased prosperity. Other cranberry work was conducted at Beach Point and Blooming Point. Mr. W. Norman Black assumed responsibilities for the supervision of the Prince Edward Island illustration stations in March 1940. He held this position until the Experimental Project Farm Contracts, as they were then called, were terminated in 1958. At that point, his position was incorporated into the experimental farm.

*MacLeod, D. J.; Howatt, J. L. 1934. Soil treatment in the control of certain soil-borne diseases of potatoes. Am. Potato J. 11:60–61.

Prior to assuming duties at Charlottetown, Norman Black worked as an assistant to Mr. Fred Kinsman, Supervisor of the Nova Scotia illustration stations. For more than 4 years, during World War II, Norman Black served as an officer in the Royal Canadian Navy Volunteer Reserve. During his absence Mr. Leo Casserley of Ottawa served as Supervisor.

Experiments initiated by Norman Black included those dealing with the importance of pastures, potato fertilization, and forage mixtures for both hay and pasture. Experiments dealing with the control of weeds, including ragwort in pastures and sowthistle in pastures and grain, also received extensive study. Many studies were conducted using barnyard manure in combination with fertilizers on various hoed crops including potatoes, turnips, mangels, and corn. In these studies, barnyard manure was very beneficial. Even for the potato crop it was very useful, particularly when applied to the preceding crop.

In cooperation with the Dominion Forest Services, farm woodlot management studies were undertaken on five illustration stations—at Rustico, Rose Valley, New London, Urbainville, and Iona. In these forest projects, the areas were mappped out in rotation, each area thinned selectively, and the crop harvested. In 1946, several thousand red and white pine as well as Norway and white spruce were planted at Alliston in an area that had been more or less abandoned. By 1980, many of these trees had reached harvest size.

In 1953, two illustration stations in the Magdalen Islands of Quebec came under the control of the Charlottetown Experimental Farm, and similar projects were conducted for the next 4 to 5 years. (A list of illustration stations, dates of operation, and their locations can be found in Appendix II.)

Experimental farm growth continues

In 1925, Dave Schurman began experimentation with cereal crops. Methods of cereal variety testing were changed. Smaller plots of five rows, 5-m long, planted in duplicates, were introduced. This enabled the farm to test more varieties than it could previously. Outstanding oat varieties introduced into the province by the farm included Victory, Banner, and Laurel. By this time, the Banner variety held a leading position in the Maritime Provinces for its popularity in seed-growing operations because it was a suitable general purpose oat. Charlottetown No. 80 barley, registered in 1916 and further perfected by Frank Tinney, had become increasingly important to Island farmers. His selections eventually became the foundation of Elite stock.

In 1927, Dave Schurman conducted experiments on the long-term use of commercial fertilizer and manure under continuous cropping. On a corresponding area, potatoes were growing in a 3-year rotation with barley and clover. These experiments demonstrated what is now well known: continuous cultivation rapidly decreases soil organic matter and results in decreasing yields. As well, Mr. Schurman's experiments showed that a combination of commercial fertilizer and barnyard manure for potatoes, or green-manure based crop rotations for potatoes, were good practices for potato producers to follow.

In 1929, Mr. R. Bruce MacLaren was hired. From early on, Bruce MacLaren worked under Frank Tinney and other researchers investigating cereals for introduction into the Maritime region.

Also, in 1929, an Advanced Registry Board for the monitoring of purebred swine was established in Prince Edward Island. This Board, working with officers of the Department of Agriculture, developed an Advanced Registry Policy, which was put into effect the following year. The purpose of this policy was to promote improvements in swine quality by providing official record of performance services.

Fire strikes dairy barn

On 14 October 1928 the dairy barn burned. The barn, which had been constructed less than 15 years earlier, drew thousands of concerned spectators who saw it burn to the ground despite the efforts of firemen. The fire was discovered after the men had finished the evening milking. The first indication of trouble was when the lights at Ravenwood House began to flicker and then went out abruptly. The same happened in the Foreman's house and in the Poultryman's house. This brought people out to see if other lights at the farm were still functioning, and when they looked across the lawns they saw the dairy barn in flames. Foreman Murdoch MacLennan and Herdsman Frank Roper removed all the cows from the barn's new extension and none were lost in the fire.

After the fire, the Ayrshire herd was kept temporarily at the nearby Dennis property, and the steers were housed in the Blake barn. The office and the Superintendent's residence caught fire during the barn blaze, but these fires were controlled. Although damage to these buildings was slight, Superintendent Artemus Clark reported that the heat became so intense that the upstairs windows in the office cracked, and paint blistered.

The dairy barn was rebuilt in 1930. The new structure contained a root cellar and a silo. The barn was built just north of the picnic grove where land was available for paddocks and bull pens.

By the end of the 1920s, the 20-year-old Charlottetown Experimental Farm had grown into an active and progressive agricultural institution. It was a time of refreshing optimism when it seemed that hard work, determination, and ingenuity were all that was required for success. With Artemus Clark at the helm, these requirements were more than fulfilled.

above left
This dairy barn was built in 1930 to replace the barn lost to fire in 1928.

below left
Henry Callbeck operates a horse-drawn hay mower, c. 1930.

opposite page
Cereal breeding plots (in foreground) looking west across railroad tracks, 1950. Left rear area later became site of the new Science Service Laboratory and the Research Complex.

CHAPTER 6

The depression years

In the early 1930s, Canada remained in the throes of the Great Depression, and the financial situation at the farm reflected Canada's generally bleak monetary outlook. For that reason, projects were slowed down and salaries frozen for many years.

To service the new dairy barn built in 1929, a dairy house with a concrete foundation was constructed in 1930. It contained a washroom, a boiler room, a cool room, and an ice storage room. A garage was also built in 1930.

In the early 1930s, swine numbers were growing, doubling to 35 from the earlier total of 18. A young boar was obtained from the La Pocatière Experimental Station in Quebec. Sows were entered in the Advanced Registry system for Swine in cooperation with the Dominion Livestock Branch. In 1931, a new piggery was built in an area northwest of the dairy barn. Erected on a concrete foundation, the building had a root cellar, feed storage and mixing room, farrowing pens, and a loft for feed and bedding. The breeding of Yorkshire swine was discontinued in the spring of 1934 and the herd was sold. The piggery was remodeled and turned over to the provincial committee in charge of swine testing under the Advanced Registry Policy for Swine. This feeding station was established to compare various strains of hogs placed on test and brought to maturity under uniform conditions of feeding and attention.

Staff changes during the 1930s were minimal. In 1930, Farm Foreman Murdoch MacLennan, who had been employed continuously at Charlottetown Experimental Farm since 1911, retired after 19 years of service. To replace him, Mr. Ivan Mitchell was selected.

In 1936, Mr. Gordon Warren was appointed Horticulturist. In 1938, Farm Gardener George Brown, who had worked at the experimental farm since 1918, retired. In his place, Mr. Ambrose Smith was hired. At this time, a beautifully maintained shrub border extending from the railroad crossing where Allen Street is now situated, about 0.4 km west to Belvedere Avenue, was admired by the general public. Maintenance of this area by Ambrose Smith and his helpers was costly and time-consuming, but it was considered important. However, when in later years the railroad fell into disuse as a passenger service, the border was done away with.

Forages receive increased emphasis

From 1932 to 1936 forage research work at Charlottetown underwent expansion in the numbers of crops and varieties tested. New crops introduced included soybean, millet, lupine, lespedeza, sudan grass, crested wheat grass, and reed canary grass. During this period, work on fertilizer use in crop rotation continued under the direction of Dave Schurman at the experimental farm and Robert Parent at the illustration stations for Prince Edward Island.

Research with swedes and mangels, which had been carried on for many years, was reduced to include only the most promising sorts available to the grower. The reason for this decision undoubtedly stemmed from the belief that research should be kept on a level immediately practical to growers.

left
Haying in 1939. Malcolm MacEachern (on load), John Hanna, Trevor Hansen.

Randomization of plots was a practice which, until this time, was conducted in an unscientific manner. A more comprehensive system of randomization was devised by Drs. C. H. Goulden, Director of National Experimental Stations, and Kenneth W. Neatby, Director of National Science Service Laboratories; Ottawa. This system was soon adopted at the Charlottetown Experimental Farm for use in plot experiments, and was used on the illustration stations as well. Variety tests, fertility experiments, crop rotations, steer-feeding tests, poultry breeding, and tree fruit orcharding continued to be emphasized.

In the late 1930s, the federal government attempted to increase Canada's diminishing draft horse population. To this end, a Percheron stallion was sent to Fredericton, and a dressy Clydesdale stallion of medium weight was sent to Charlottetown from the Central Experimental Farm, Ottawa, both for breeding service. Dr. Clark believed that the new Clydesdale stallion would be better off if given regular light work. Ottawa decided otherwise, so the Clydesdale was placed in a roomy box stall, given the best feed available, and kept in top show condition. Almost daily, farmers brought mares to be bred. Many fine draft horses were produced as a result of this project.

CHAPTER 7

World war II and beyond

The farm had to cope with a smaller staff when Canada became involved in World War II, because many employees enlisted in the Canadian military (see Military service list, Appendix III).

In 1939, a new office building was constructed to accommodate the farm's growing administrative requirements.

In 1942, the station's original stenographer, Edith Sterns, retired after 24 years of continuous service.

Soil laboratory starts

The year 1943 was a red-letter one for the farm. A joint federal–provincial soil program was started, which marked the beginning of what is now the Prince Edward Island Soil and Feed Testing Service. From the beginning, this laboratory provided free soil advisory services to farmers and gardeners. In cooperation with the federal government, samples from experimental farm and illustration station research plots were collected, prepared, and analyzed under the direction of Mr. George B. Whiteside. Prior to coming to Prince Edward Island, George Whiteside had spent 9 years surveying Nova Scotia soils.

During the 1920s, soil samples had been collected from all illustration stations in Prince Edward Island. These samples were shipped to Dr. Frank L. Shutt, a soil scientist for the department, who was situated in Ottawa. In 1928, Frank Shutt published a pamphlet on his findings entitled *Soils of P.E.I.* Mr. Whiteside, who conducted a reconnaissance-type survey of nearly two-thirds of the Island during the summer of 1943, found the soil booklet helpful to him in his work. In April 1944, Mr. J. E. Arsenault was appointed by the provincial government to assist Mr. Whiteside. That summer, the survey concentrated on the remaining one-third of the province. By summer's end, the field work was essentially complete. The collected data were later compiled into a publication entitled *Soil survey of Prince Edward Island.*

Although George Whiteside was the senior federal staff member from the laboratory's establishment in 1943, during the first decades his salary and supplies were paid for by the Soil Department, Ottawa. The farm provided accommodations and the provincial government supplied assistant personnel, who were required to submit periodic progress reports to the provincial Deputy Minister of Agriculture.

The laboratory conducted fertility research on three of the main soil types. These included Charlottetown fine sandy loam, Culloden sandy loam, and O'Leary clay loam. This research was done cooperatively with farmers. Farmers provided the land, seed, and cultivation free. The laboratory provided and applied the fertilizer and took yield and soil samples. The farmers then handled the crops as they wished.

Abegweit oat developed

In 1946, Charlottetown Experimental Farm released an oat variety that replaced Erban, the variety introduced to Prince Edward Island in 1937 when much of the oats and wheat grown in that province was ravaged by rust diseases. When it was introduced, Erban outyielded all other oats and was resistant to rusts and many other cereal diseases. Abegweit oat, developed by Bruce MacLaren, was a cross between Erban and the stem-rust resistant Vanguard variety. Abegweit oat became widely used in breeding programs throughout Canada and the United States. In addition, it was popular among Alberta cereal growers.

Due to wartime fiscal restraints, no progress reports were issued by the station from 1937 to 1947. The report of work at Charlottetown Experimental Farm, which was not published until 1948, indicated a reasonable level of activity in the research of poultry, pigs, dairy, vegetables, forages, and cereals, among others. The dairy program had made considerable strides. During the 11-year period from 1937 to 1947, 97 lactations were completed from the purebred Ayrshire herd with average lactations reaching 4135 kg. The average butterfat test for the entire period, including dry periods, was 4.1 percent. The report also noted that Charlottetown No. 80 barley, developed when the station first began, was still unsurpassed in its quality, although new varieties were continually being tested to determine their value on Prince Edward Island.

In 1947, Dr. Artemus Clark, who was instrumental in the development of the Charlottetown Experimental Farm, retired after 38 years of faithful service to the department.

Following his retirement, Dr. Clark continued to reside in the community until his death at the age of 95. Dr. Clark maintained his interest in the agricultural industry and for the 5-year period 1951–1956 wrote a column, known as *Newsy notes*, for the local daily newspaper. *Newsy notes* included many topics on agriculture.

above

The office building constructed in 1939. This building is now occupied by staff of the Food Production and Inspection Branch.

CHAPTER 8

The postwar era brings a new superintendent

above
Robert C. Parent, Superintendent, 1947–1966

below right
Pitching hay at the farm. *From left*: Cy Pickard, John Hanna, Gus Wisner, and Douglas MacLeod (1947). Blake House can be seen in front of the hay wagon.

opposite page
The use of identical twin steers in nutritional experiments enable researchers to conduct a wider variety of tests than would be possible using conventional stock.

Robert Parent, who had served for 20 years as Supervisor of Illustrations Stations, first in Prince Edward Island and then in New Brunswick, was appointed to the position of Superintendent, Charlottetown Experimental Farm in 1947. Since no progress report had been issued in 10 years, one of the first tasks undertaken by Robert Parent and his staff was to compile the results of the farm's experiments (1937–1947) into a report, which was produced in 1948.

When Mr. Parent first became Superintendent he noted that the original land leased from the provincial government in the early 1900s remained in that government's possession, although numerous land purchases made by the federal government in later years surrounded this parcel. He contacted provincial Premier J. Walter Jones and, after a series of discussions, convinced him to authorize the sale of the property to the Crown for $8867.25, which equaled the sum paid for its purchase in 1909 minus the sum paid by the federal government for its long-term lease in that year.

The farm required more land in order to accommodate expanding programs. Robert Parent set about to do this. Through trade and purchase, about 110 ha of land were acquired on the outskirts of Charlottetown (see Land transactions, Appendix I). The largest of these purchases was the Upton Farm.

In 1948, Mr. Parent discussed the formation of a federal–provincial organization with Mr. Walter Shaw, Deputy Minister of Agriculture for Prince Edward Island. The model for the organization was one in operation in New Brunswick and with which Robert had become familiar during his employment in that province. Subsequently, a Federal–Provincial Agricultural Council was organized and remained active for approximately 20 years. The Council met annually and representatives of both federal and provincial departments of agriculture discussed problems, progress, and plans. This exchange of information aided communications, prevented duplication of effort, and resulted in better supported recommendations to the industry.

Dairy program aided

The Upton Farm purchase offered a timely alternative to the former dairy facility, which was small, outmoded, and situated too close to a densely populated area. When Upton Farm was purchased, a pole-type barn for young cattle was constructed. Many young cattle were housed in it each year. Later, two residences were built for the use of farm personnel.

From the beginning, Robert Parent took a keen interest in livestock breeding. To encourage the use of artificial breeding, the farm placed a barn at the disposal of the directors of the Central Ayrshire Breeding Unit to house their bulls. Two bulls of each of the following breeds were kept: Ayrshire, Guernsey, Holstein, Jersey, and Shorthorn. Harold Storey, the farm's inseminator, was loaned to the Charlottetown facility for a short time. This was all that was needed to encourage breeders to heed the possibilities for genetic improvement within the industry. In later years, the breeding unit linked up with the unit in Fredericton, N.B., and began using frozen semen.

In 1951, Dr. Jim Nicholson was appointed the first full-time research officer in charge of dairy projects. Dr. Nicholson conducted many interesting experiments at Charlottetown, but he is probably best known for his studies on the feeding of cull potatoes to cows. He demonstrated that culls could replace turnips as a succulent feed for dairy cows when fed at the rate of about 1.75 kg/100 kg of body weight. He showed that this quantity of potatoes did not affect the flavor or quality of milk.

A number of nutritional experiments using identical twin steers were conducted at Charlottetown, under the direction of Jim Nicholson. These animals exhibited striking similarities in appearance, and their nose prints were identical. It was determined that such test subjects could prove useful in several experiments in which accuracy of results depended upon similar inheritable characteristics.

James Williams came to work in the dairy at a time when the calf mortality rate was high. Being the kind of employee who enjoyed a challenge, James Williams applied his skills in herd management and soon brought the problem under control.

During the early years of Robert Parent's direction, the pole-type barn at the Upton Farm was extended and a self-feeding horizontal silo installed. The main barn at headquarters was enlarged and equipped with 30 additional calf pens. A modern bull barn was constructed there and the artificial insemination unit was modernized.

In the mid-1950s, a comprehensive study called Inheritance Study of Dairy Cattle was undertaken as a cooperative effort of experimental farms across Canada and private breeders. This study was launched under the direction of Dr. Charles Hickman of Ottawa. Ayrshire bulls for the study were maintained at Charlottetown, and the semen from the bulls was frozen for distribution to other experimental farms or stations from Ottawa. The object of this experiment was to study the inheritance of economically important traits in dairy cattle, for their eventual application in the industry.

Research aids cucumber industry

In the late 1940s, Matthew Wells Company, Guelph, Ont., established a pickling plant for cucumbers in Prince Edward Island. Because large quantities of fresh cucumbers were needed, the company asked Charlottetown Experimental Farm for help with management advice. Both the growers and the processing company needed such assistance to maximize the potential for this industry. In Prince Edward Island, 285 ha of cucumbers were grown by farmers in 1947. To help the industry, the farm conducted extensive variety and soil fertility tests. As well, cultural practices were examined. Cucumber work was conducted under the direction of Gordon Warren. Although the Matthew Wells Company has ceased operating in Prince Edward Island cucumber growing remains a profitable side-operation for a number of Island growers.

In 1950, a great deal of paving was done at the farm. Roads leading from the rear of the farm to the office and other major farm buildings were paved. Work was started on an extension to the office, allowing room for an enlarged soil laboratory and additional offices. This was completed in 1952.

above

Soil researcher George Whiteside (*right*) explains Prince Edward Island soil profile to Reg Kemp.

below

Dr. J. Artemus Clark, who selected Charlottetown No. 80 barley in 1912, examines a few heads of the variety while Robert Parent looks on.

In 1950, Mr. George Whiteside became an employee of Charlottetown Experimental Farm as a soil fertility researcher. The reconnaissance soil survey report and soil map he had prepared earlier were submitted to department officials to review and approve for printing. These documents outlined the characteristics of various soil groups and their effect upon crop production. At the request of provincial Premier J. Walter Jones, copies of the report and map were placed in all schools on the Island.

Mr. Schurman, who had been in the farm's employ since 1918 and had served in the capacity of Assistant Superintendent in Charge of Field Husbandry and Forages, retired in 1952. Dave Schurman was a highly motivated individual and had participated in more than 50 projects. He was often consulted by other staff members and the general public about horticultural matters. He was replaced in field husbandry studies in 1952 by Graeme Boswall. However, after 3 years Graeme Boswall took a leave of absence to complete postgraduate studies and then accepted a position with the Macdonald Tobacco Company. Dave Schurman's forage responsibilities were assumed by Keith Lelacheur.

In 1946, Bruce MacLaren reported the first sighting of the barley jointworm in Prince Edward Island at the Monticello Illustration Station. Later, after the jointworm was found to be a problem throughout the province, barley breeding at Charlottetown was geared to the development and identification of varieties resistant to this pest.

Cereal program becomes regional responsibility

In 1953, cereal research at Charlottetown was given increased emphasis when cereal researchers at the experimental farms in the Atlantic Provinces were organized as a project group, and Charlottetown was given the responsibility for coordinating the work. In the early stages, emphasis was given to cereal variety evaluation and breeding. Greenhouse facilities and additional staff were made available at Charlottetown in order that cereal crop problems could be investigated at the regional level. At that time, Dick Sterling came to Charlottetown as a cereal breeder with regional responsibility. Working with Bruce MacLaren, he began research in breeding barley for resistance to the barley jointworm. In recent years, the

capability of the station to deal with cereal production problems of the Atlantic region increased progressively with the introduction of two cereal pathologists, a wheat breeder, and a cereal crops nutritionist.

During the mid-1950s, strawberry research at Charlottetown Experimental Farm was extensive. A screenhouse designed specifically for use in the multiplication of virus-free strawberry plants for distribution to selected growers was constructed. Later, progress was made in speeding up the formation of runners, which aided the propagation of strawberry varieties in greenhouses. As well, studies on the leaf tier and white grubs and their control were conducted under the able direction of farm horticulturist, Gordon Warren.

In 1958, Frank Tinney, who had served as Superintendent Artemus Clark's assistant during the establishing years and who in later years directed the poultry research program, retired after 42 years of service. Then, in January 1959, Roy Crawford was named Research Officer in poultry genetics at the farm, to replace Mr. Tinney.

Doug Munro was hired in 1959 to conduct soil fertility experiments. Working in close cooperation with the Federal–Provincial Soil Laboratory, Doug also became the farm's potato project leader, conducting soil fertility experiments to help the potato processing industry.

The year 1959 was important at Charlottetown, marking the 50th anniversary of the farm's establishment (see Chapter 11, Charlottetown Experimental Farm celebrates 50th anniversary). Also, and just as important, the Research Branch of Agriculture Canada was formed. Incorporating all units of the former experimental farms, stations, and science services, the new branch, brought a team approach to the solution of food production problems.

The amalgamation of the two previously separate research establishments, the Experimental Farm Service and the Science Service, was begun under the Supervision of Robert Parent. But, before the amalgamation of the two branches is dealt with, some background on the Science Service Laboratory, Charlottetown, would be helpful.

above

Staff of the Charlottetown Experimental Farm in front of Ravenwood House, c. 1958.

below

Charlottetown Experimental Farm, mid-1950s

CHAPTER 9

Science Service Laboratory—1915–1959

above left
Dr. Paul A. Murphy, Officer in Charge, 1915–1920

above right
Richard R. Hurst, Officer in Charge, 1925–1961

Plant pathology laboratory opens

The Plant Pathology Laboratory, which was administered separately from the Charlottetown Experimental Farm, was established in 1915 to conduct a program of research on plant diseases. It was later called the Science Service Laboratory.

Dr. Paul A. Murphy was the first Officer in Charge of the Plant Pathology Laboratory. Dr. Murphy, a leader in his field, developed a program for the investigation of plant diseases and headed the newly formed seed potato inspection service for Prince Edward Island and Nova Scotia. A pioneer in the study of potato viral diseases, and in cooperation with Mr. E. J. Wortley in Bermuda, he confirmed the finding of Dr. Quanjer, the Dutch scientist who had observed that potato leaf roll virus was transmitted to healthy plants growing in close proximity to diseased ones.

In 1920, Dr. Murphy left his position to accept a similar post in Ireland and Mr. Sidney G. Peppin was named to head the Seed Potato Inspection Service. Mr. J. B. McCurry was made Officer in Charge of the laboratory.

During Mr. McCurry's 3-year term, he worked principally on the program begun by Dr. Paul Murphy. There was an ever-increasing interest in the testing of chemical seed treatments to control cereal smuts and potato diseases. The use of lime in the control of clubroot was also being investigated. In 1923, Mr. McCurry transferred from Charlottetown to Ottawa, where he was placed in charge of the Canadian Plant Disease Survey and Mr. Richard R. Hurst was appointed head of the Plant Pathology Laboratory for Prince Edward Island in 1925. Mr. Hurst held the position of Officer in Charge until his retirement in 1960.

In 1929, Mr. Hurst wrote a bulletin on late blight of potatoes entitled *Late blight and rot of potatoes*. This bulletin was considered an excellent treatise on the subject. Over the years, Mr. Hurst often attended illustration station field days to explain to farmers the optimum proportions of bluestone and lime to use as a fungicide for potato late blight prevention.

Between 1925 and 1929, Mr. Hurst was assisted during the summer months by Mr. J. Lorne Howatt, who served both as potato inspector and research assistant. In 1930, Mr. Howatt was appointed Plant Pathologist at the Plant Pathology Laboratory in Fredericton.

In 1937, George Ayers joined the staff at the laboratory as Assistant Plant Pathologist. He began investigating the clubroot disease in rutabagas and he became the first scientist to demonstrate that there are a number of races of the organism that causes clubroot in rutabagas.

Laboratory acquires entomology unit

Between 1911 and 1919, entomology laboratories were established in all provinces except Prince Edward Island. For years entomology work in Prince Edward Island was the responsibility of Mr. R. P. Gorham of the Fredericton laboratory and Mr. Arthur Kelsall of the Annapolis Royal Laboratory. However, since they had a full roster of duties in their own provinces, they were not able to spend a great deal of time studying insect problems on Prince Edward Island.

The year 1937 was a key year for the Plant Pathology Laboratory on the national as well as the local level. In that year, the federal Department of Agriculture underwent its first major reorganization. The purpose of this restructuring, which organized the branches into services on a functional basis, was "to bring under one administrative head, services similar in character and purpose in the broad fields of activity with respect to the marketing of different agricultural products, their production from a national standpoint, and the experimental and scientific work in connection herewith." At this time, Prince Edward Island was deemed by the department to be in serious need of an entomology research unit. Richard Hurst was in total agreement.

Mr. Fred M. Cannon was asked by the Science Service to study entomology at Macdonald College in order to prepare for a career with the proposed unit in Charlottetown. Fred Cannon accepted the offer and in 1937 he organized the Prince Edward Island Division of Entomology.

Fred Cannon surveyed the province to determine which pests posed the most serious threat to Island agriculture. He conducted research into the control of the strawberry weevil, a particularly active fruit pest at that time. Screening a number of chemicals to control this pest, he finally demonstrated that cryolite dust was the most effective product available. Soon, the chemical was widely used to control the strawberry weevil in Prince Edward Island and Nova Scotia. He also investigated the barley jointworm, potato insects, and root maggots, among other insect pests. He was often called upon to advise farmers on insect control; this was an especially important service because at that time there was no one in the province's Department of Agriculture to answer such questions.

In 1941, George Ayers joined the R.C.A.F. and served until 1945. In 1944, his study on clubroot entitled *Studies on the life history of the clubroot organism Plasmodiophora brassicae*, which had been submitted in his absence, was published. All rutabaga breeding and disease work stopped while George served with the R.C.A.F. Upon his return to the laboratory, George Ayers resumed his study of clubroot, traveling throughout the Maritimes and Quebec to collect representative soil samples. Samples from British Columbia and Ontario were shipped to him at Charlottetown. During the time George was developing a set of differentials to determine the numbers of clubroot organism races present in Canadian soils, he collected clubbed roots filled with spores and evaluated these for disease as well. In 1952, George Ayers, in cooperation with Keith LeLacheur, began work on a few disease-free rutabagas collected from infected fields. Their objective was to make the material homozygous and, therefore, suitable as a variety for commercial production.

In 1943, Lorne C. Callbeck was hired to work at the Plant Pathology Laboratory. Mr. Hurst recruited Lorne Callbeck to conduct a research program on epidemiology and control of late blight of potato. In addition to this research program, Lorne's responsibilities included evaluating potential new fungicides for the control of late blight and he was the only one to do so in Canada for many years.

left
Fred M. Cannon, Officer in Charge, 1937–1961

In 1948, Dean B. Robinson came to work at the laboratory as a full-time research officer in the field of potato and vegetable diseases. He investigated such problems as blackleg and Verticillium wilt of potato, and delved into the connections between plant micronutrient deficiencies and disease. He was granted educational leave and, in 1957, was awarded a Ph.D. degree after completing a thesis project on potato and vegetable diseases. Later, Dr. Robinson, in cooperation with other Science Service Laboratory staff, began investigating a problem that was causing market gardeners to lose a portion of their cauliflower crop each year. The problem was diagnosed as molybdenum deficiency. After the problem was established, determinations were made on amounts of the trace mineral to apply to soil and in spray treatments, and which methods of application were most effective.

Seed potato certification service helps industry

By the late 1940s, the Science Service Laboratory's seed potato certification service had aided the province's seed potato industry to an unusual extent. Seed potato production increased from 360 ha, grown in 1920, to a high in 1948 of 15 700 ha. Chiefly due to the efforts of the seed potato inspectors, many Island seed potato growers were by this time planting some portion of their crops in tuber units. This and other practices recommended by the service were considered largely responsible for the success of the industry to that point.

Science service laboratory burns

The year 1951 began as a seemingly normal one at the Science Service Laboratory. Then, fire struck! The blaze, which started around 2 A.M. 31 January 1951, swept through the building, destroying everything. The weather, a frigid –25°C, was accompanied by biting winds. The fire, which was discovered by night watchman Leeman MacLeod, was declared out of control at 3:30 A.M. During the fire, chemicals stored in the building exploded because of the intense heat. A well-supplied herbarium plus a number of insect collections burned. All scientific instruments were lost. The only object saved was the laboratory's adjoining greenhouse. Luckily, it was later determined that the documents which had burned were not originals but duplicates. The originals had been sent to Ottawa for safekeeping.

That morning, Science Service officials in Ottawa were informed of the blaze. Plans for a new, larger unit were under way immediately. Dr. W. E. Van Steenburgh, Associate Director of Science Service in Ottawa, visited the Charlottetown laboratory site to evaluate the situation and decide what course of action to take. After much deliberation, a new site was chosen on what is now University Avenue.

The reason for the fire, which caused about $100 000 damage, was never determined officially; however, it was suspected to be a furnace that malfunctioned.

Starting over

The fire and resulting loss of a work base came as a tremendous disappointment to Richard Hurst. When the Science Service Laboratory staff moved to their temporary headquarters at Charlottetown Experimental Farm's Birch Court building, he commented, "We have nothing to put into Birch Court except our hands and lots of ambition."

above right

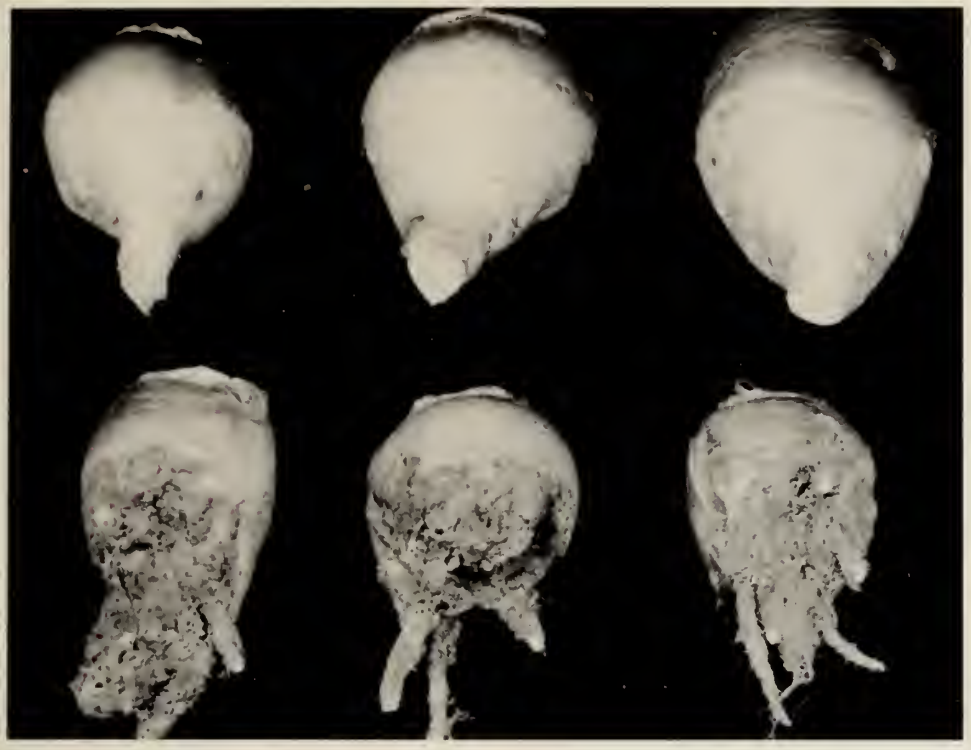
Science Service Laboratory, which burned in 1951.

center

This building, known as Birch Court, was moved to the Experimental Farm in 1947 from the Charlottetown Airport, where it had served as a wartime army hut.

below right

The new Science Service Laboratory building, completed in 1952.



The new Science Service Laboratory building, constructed of reinforced concrete with red brick facing, offered all the amenities needed to facilitate staff research. These included up-to-date laboratory apparatus and temperature control facilities. The lower floor housed Richard Hurst's plant pathology unit, whereas Fred Cannon's entomology unit was situated on the upper floor. This floor also housed the seed certification headquarters, under the direction of Mr. Henry L. MacLaren. The new building was ready for occupancy a year after the fire.

Mr. J. Ewen Campbell was appointed plant pathologist at the Science Service Laboratory in 1950, and in 1952 he began to rebuild the herbarium, which had been lost in the fire. The only botanist in Prince Edward Island, he was considered the individual to consult whenever it was necessary to have plants identified. His work in weed collecting was continued later by others, including Bruce MacLaren. Ewen Campbell conducted research alone and in cooperation with others on potato diseases and on micronutrient deficiencies in vegetable crops. In 1966, he resigned from the Research Branch to become Officer in Charge of the Seed Potato Inspection Service for Prince Edward Island.

In 1951, Dr. Dean C. Read was appointed assistant entomologist to study the biology and control of soil and foliage insect pests of cruciferous crops. Granted educational leave, he completed both an M.Sc. program and a Ph.D. program following his initial appointment. His first research involved studies on the biology and control of the root maggots attacking cruciferous crops. In 1952, he developed the first efficient mass-rearing technique for culturing large numbers of these serious insect pests in the laboratory. By 1955, he had developed methods of applying selected insecticides that would provide almost complete control of these insects in rutabagas, cabbage, and other stem crucifers.

above left
Cabbage maggot control with insecticides. Maggot-injured roots in the lower half of photo.

below left
Subsurface insecticide applicator with fertilizer and seeder attachments. This machine, designed by Dr. D. C. Read, has been used extensively for more than 25 years in research projects and for on-farm use.

Dr. Read developed a machine that placed insecticides in precise bands below the seed. This placement gave good insect control and minimized the effect of the insecticides on the natural predators and parasites of the target insects. The prototype machine developed by Dr. Read was eventually produced commercially.

In 1949, Miss Mickey MacLeod joined the entomology staff of the Science Service as assistant entomologist. She resigned in 1953, shortly after her marriage to Mr. Fred Cannon. In 1951, Mr. Allison B. Stevenson joined the staff as assistant entomologist, a position he occupied until he transferred to Vineland Research Station in 1953. In 1953, Mr. Freeman L. McEwen was hired as assistant entomologist. He resigned in 1955.

Mr. Leith S. Thompson became a full-time entomology staff member in 1956, replacing Freeman McEwen. His work centered on potato, bean, and cucumber insects. Mr. Thompson found that seed treatments offered effective control of seed corn maggots. These treatments, developed principally to aid the cucumber industry, were useful in bean production too. Mr. Thompson was granted educational leave and completed a Ph.D. program in 1961. Following his return to Charlottetown Experimental Farm (Science Service and Experimental Farm Service had amalgamated while he was on educational leave), Dr. Thompson began working with insects of forage crops. He conducted a survey of Prince Edward Island, identifying 25 known forage crop pests. This survey established a firm base for further investigations.

above

In 1953, the Science Service Laboratory staff took part in a Red Cross first-aid course. *Back left*: Fred Cannon, Ewen Campbell, Dean Robinson, Dean Read, Lorne Callbeck, George Ayers, Glen Ramsay, Gordon Ross, Allison Stevenson, John Richard, and George Lewis. *Front left*: Florine Evans, Lois MacLaren, the first-aid instructor (unidentified), and Velma Carmody.

below

This device, also designed by Dr. D. C. Read, is a collapsible insect-collecting cage. It is transported on a rack on top of an automobile, and is used for mass collection of insects in field plots.

CHAPTER 10

Charlottetown Experimental Farm–Science Service Laboratory merge—1959–1960

When the decision was made to amalgamate Charlottetown Experimental Farm and Science Service Laboratory, 10 professional staff worked at Charlottetown Experimental Farm and eight worked at Science Service Laboratory.

Mr. Richard Hurst, who had directed the Science Service Laboratory almost since its establishment in Prince Edward Island, was due to retire in 1 year. It was decided, therefore, that the amalgamation would not begin until he had retired. Miss Iris MacLellan, who had served as Richard Hurst's secretary, continued as the farm's librarian. Mrs. Ruth (Toombs) Baldwin continued as Robert Parent's secretary.

It was Robert Parent's task to assure that the transition of authority was made as smoothly as possible. From 1960 on, plant disease research and insect research came under the direction of Charlottetown Experimental Farm. The Science Service Laboratory staff continued to work in the laboratory facility constructed in 1952.

CHAPTER 11

Charlottetown Experimental Farm celebrates 50th anniversary

Charlottetown Experimental Farm celebrated its 50th anniversary in August 1959. In honor of this important event, a cairn was constructed of Prince Edward Island red sandstone. This cairn was unveiled at the farm by the Honourable Douglas Scott Harkness, Minister of Agriculture for Canada.

The cairn was constructed by Colonel E. W. Johnston of Burlington and Mr. Ernest Dunning of Clifton, aided by Mr. Bayfield Shaw of the farm staff. The stones in the cairn, a gift from the City of Charlottetown, were taken from the 1904 Farmer's Market building, which had been located in the downtown area until it was destroyed by fire in 1958.

Colonel F. I. Andrew, a prominent Ayrshire breeder, presented the farm with a large millstone at the time of the anniversary. The millstone was used as a base for a flag pole.

Also attending the celebration were the Honourable J. Angus MacLean, federal Minister of Fisheries; the Honourable A. W. Matheson, Premier of Prince Edward Island; His Worship Edwin Johnstone, Mayor of the City of Charlottetown; Chief Justice Thane Campbell; several Members of Parliament; Mr. Kenneth MacLean, President of the Prince Edward Island Federation of Agriculture; and, appropriately enough, Dr. Artemus Clark, the farm's first Superintendent.

During the festivities, an overview of the farm's accomplishments and their effect on Island agriculture was delivered by the Superintendent, Robert Parent. This was followed by staff-conducted tours of the Upton Farm. Earlier in the day, visitors to the farm were taken on tours of the barns, laboratories, greenhouses, poultry plant, farm implement museum, and grounds.

left
The Charlottetown Experimental Farm celebrated its 50th anniversary on 10 August 1959. Minister of Agriculture, the Honourable Douglas S. Harkness (*left*), examines the cairn he unveiled to mark the occasion; Dr. J. Artemus Clark and Mr. Robert C. Parent look on.

CHAPTER 12

The 1960s begin

The early 1960s brought tighter budgets for and slower growth of the Research Branch. However, these harsh economic realities did little to dampen the spirits of the Charlottetown Experimental Farm staff.

Amalgamation under way

When the Science Service Laboratory and Charlottetown Experimental Farm merged, Robert Parent and the increased farm staff worked to make programs take shape and progress at Charlottetown. Although the farm underwent some major managerial changes during the amalgamation, the decision to join forces was a wise one.

Two former Science Service Laboratory staff die

Just 3 months after Richard Hurst retired in 1961, he suffered a fatal heart attack. His death was the subject of an editorial in a local newspaper. Later in 1961, Dr. Dean B. Robinson, who had conducted valuable plant pathology research at Charlottetown for 15 years, died of cancer at the age of 39.

Work conducted by Science Service Laboratory staff prior to amalgamation continued much as before, but with a measure of cooperative input from Charlottetown Experimental Farm staff. For example, much of former Science Service entomologist Dean Read's work throughout the late 1950s and early 1960s involved the control of root maggots in rutabagas and stem crucifers, carrot rust flies in carrots, wireworm in potatoes and other root crops, white grub and cutworm in strawberries, tobacco, and other plants, as well as control of foliage insects. These experiments were conducted alone and in cooperation with experimental farm staff and with provincial staff. Throughout this period, Dean Read developed methods for control of soil insect pests, first using cyclodiene and then using organophosphorus insecticides. When certain insects began to develop resistance to the cyclodiene-type insecticides then in common use, Dean Read was able to suggest organophosphorus insecticides as substitutes.

Dean worked out the rate of movement and breakdown of cyclodiene insecticides in the soil, their absorption and retention by plant tissue, and the relative toxicity of different compounds. He demonstrated that some compounds behaved erratically in the soil and that some were not readily broken down by plant tissue. As a result of these findings, such pesticides were either refused registration for commercial use or withdrawn from the market. Also at this time, Dean Read was involved in conducting studies on integrated pest management, a field which has grown very popular in recent years.

York rutabaga released

Former Science Service Laboratory research officer George Ayers, who had been working for many years to develop a method for determining the numbers of clubroot races present in soils, achieved this goal in 1960. By 1964, his rutabaga research culminated in the development of a new clubroot resistance variety, York. This variety was named after the village of York, P.E.I., where the clubroot-free rutabagas used to develop the new variety were discovered.

York, which practically revolutionized the region's rutabaga industry, is now the province's most commonly grown rutabaga.

Dairy work continues

The dairy program, which had gained a high level of integrity, continued to strive for improved methods of calf rearing. In 1961, Dr. Jim Nicholson transferred to Nappan Experimental Farm. His position was filled by Mr. Albert D. L. Gorrill. During Mr. Gorrill's stay at Charlottetown, he conducted experiments on the rearing of calves on pasture and on milk replacers. He transferred to Fredericton Research Station in 1966.

Soil laboratory closes

In 1961, the Soil Laboratory, a joint federal–provincial responsibility under the able direction of George Whiteside, was made a provincial responsibility under the direction of Andrew Humphrey, George Whiteside's former assistant, who became provincial soil analyst. The new provincial Soil Advisory Laboratory, a separate entity, remained at the farm, and a new federal laboratory was established in the former Science Service building. Dr. Don C. MacKay, a soils researcher, was hired in 1961 as Section Head, Soils. In this capacity, he evaluated and made recommendations on soil fertility as it related to potatoes, tobacco production, and vegetable crops. Among Dr. MacKay's activities during his 5-year stay at Charlottetown were studies, conducted in cooperation with Doug Munro and Jack Cutcliffe, relating nutrient levels in soils and plant tissues to ultimate yields. With Dr. Umesh Gupta and other researchers, Dr. MacKay evaluated copper and molybdenum fertilization of vegetable crops grown on organic soils.

Tobacco program launched

Results of the first commercial tobacco crop grown in Prince Edward Island in 1959 had been promising, demonstrating to federal and provincial agronomists that parts of Prince Edward Island were indeed well suited to tobacco production. Sensing the need for more research to maximize the crop's potential in the region, the farm rallied forces behind Dr. MacKay in efforts to explore the fertilizer requirement of tobacco plants. Word began to spread throughout southern Ontario about the Island's potential as a tobacco-growing area. This delighted many there, because land costs in Prince Edward Island were less than costs for similar land parcels in Ontario. Soon, tobacco operations were being established on the Island. Ontarians, Prince Edward Island residents, and those from as far away as Western Europe invested their time and money in the Island's tobacco industry, which witnessed considerable growth during the 1960s and 1970s. Soon after Dr. MacKay's arrival at Charlottetown, Research Officer Keith LeLacheur was assigned responsibility for tobacco. Keith LeLacheur, who worked in cooperation with Dr. MacKay, quickly learned a great deal about the industry. Keith's investigation of the industry and its needs took him to Delhi Research Station, where he conferred with tobacco research experts. He concluded that the Maritimes region, if it were to become a tobacco-growing area, would need to address several specific production challenges. The development of varieties suitable for the region's cool, moist climate was required. The crop's soil fertility requirements had to be better understood. Soil pests also posed an obstacle to commercial tobacco production. Experimentation began, varieties were tested, and tobacco samples were cured and analyzed. Results of these tests were transmitted to growers through press releases, grower meetings, and individual consultation.

Apple testing phased out

In 1960, the apple variety testing program, which had been conducted for 50 years at Charlottetown, ended. The reasons for discontinuing the program and uprooting the orchard were mainly economic. Since 1910, when the Island had 114 000 apple trees under commercial production, Prince Edward Island's apple industry had suffered a steady decline. Competition from neighboring areas such as the Annapolis Valley, with milder, more suitable climates, made it difficult for Island apple growers to compete. In 1934, the industry was dealt a particularly harsh blow when winterkill destroyed or seriously damaged more than 50 percent of all mature apple trees. These factors, combined with the increasing difficulty in finding reliable fruit pickers, caused production to diminish gradually until 1960, when just 8000 trees remained under commercial production.

In 1961, Gordon Warren, who was directly responsible for horticultural programs at Charlottetown since 1936, left the farm to accept a position with Canadian Broadcasting Corporation, Halifax, as the Maritime Gardener.

In 1962, the horticulturist position vacated by Mr. Warren, was filled by Mr. Jack Cutcliffe. Jack came to the farm at a time when the vegetable-processing industry on the Island was just becoming established.

In support of the industry, Jack Cutcliffe conducted studies alone and in cooperation with other scientists on fertility, management, and variety evaluation of cole crops, rutabagas, and peas. Nutrient requirements, improved management practices, and best-rated varieties were determined. One individual who worked in cooperation with Jack Cutcliffe was Dr. Umesh Gupta; he was appointed in 1963 to conduct soil and plant micronutrient research. Dr. Gupta developed modified techniques to determine levels of boron in soils and plants. These methods were both simple and rapid. He also demonstrated the optimum and deficiency levels of a number of micronutrients in several crops.

Dr. Carl Willis was appointed in 1962 to investigate plant diseases in forage crops. He teamed up with Dr. Leith Thompson at this time to study the roles of insects, nematodes, and diseases and their possible relationships to root rots in forage legumes. The study also shed light on the susceptibility of forage legumes to these pests and demonstrated the relationships between nematodes and other soil-borne pathogens.

Poultry program ends

Roy D. Crawford, Poultry Genetics Research Officer, was granted educational leave in 1960 to complete a doctorate program. Upon his return to the farm in 1963, the poultry program, which had been carried out at Charlottetown since the farm was instituted, was terminated. The two employees of the program, Dr. Crawford and a technician, were transferred to Kentville Research Station, which had been given regional responsibility for poultry research.

Barley jointworm rearing technique developed

In 1965, Dick Sterling and Bruce MacLaren developed a highly efficient technique for rearing female barley jointworms for use in research. Infested barley stubble containing jointworm larvae was subjected to cold treatment in order to simulate winter conditions. This broke the resting stage of the larvae and when warmer temperatures and high humidity were later applied to simulate a spring environment, adult jointworms emerged from the stubble. These adults were normally females, which were then used to infest barley plants being used in the development of jointworm resistant varieties.

In 1965, Dr. Lloyd B. MacLeod transferred from Nappan Experimental Farm and was appointed to head the Plant Nutrition Section at Charlottetown. In this capacity, Lloyd MacLeod was responsible for conducting and coordinating research on livestock feed crops in the Atlantic re-

above
Harvesting brussels sprouts in the 1960s.

gion. He began to conduct a variety of field, greenhouse, and hydroponic experiments with emphasis on the macronutrient requirements of cereal and forage crops. As well, Dr. MacLeod delved into the effects of aluminum on root development and evaluated the action of lime on acid podzol soils. Through the use of nutrient solution and soil culture he observed the basic relationships of nitrogen and potassium in plant metabolism. Lloyd MacLeod also took an active interest in the use of alfalfa as a regional forage crop, and helped revive interest in winter wheat production through his research plots and promotion at grower field days.

In December 1966, Dr. MacKay transferred to Lethbridge Research Station to head the soils research program there. At that time, the Soils Section and Plant Nutrition Section were separate. Early in 1967, the two sections were joined, and Dr. Lloyd MacLeod was appointed to head the new Soils and Plant Nutrition Section.

In 1966, Dr. Michio Suzuki joined the farm to conduct research in plant physiology and biochemistry. During the early years, Dr. Suzuki's studies involved experiments on metabolic functions in timothy storage tissue. Devising ways to determine molecular weight and other physical properties of certain carbohydrate reserves in timothy were among Dr. Suzuki's activities. During the early years, alone and in cooperation with Dr. MacLeod, Dr. Suzuki investigated ways to assist forage producers in the region in their effort to grow high-quality crops.

above
Hydroponics studies on aluminum toxicity of feed crops were begun at Charlottetown in the mid-1960s.

Superintendent retires

An agricultural career, which had spanned nearly 40 years in the federal Civil Service, was drawing to a close. Robert Parent, who had served as Superintendent during the two postwar decades—years in which the station and other institutions like it had enjoyed unprecedented growth—had reached retirement. Until a replacement for Mr. Parent was found, George Ayers was named Acting Superintendent.

Shortly after retirement Mr. Parent, with the assistance of many colleagues, including James Williams, Herdsman at the farm, wrote and had published a history of the dairy industry in Prince Edward Island.

CHAPTER 13

Appointment of first Director

above
Dr. Glen C. Russell, Director, 1966–1970

Dr. Glen C. Russell was appointed Director, Charlottetown Experimental Farm in August 1966. Dr. Russell noted immediately upon arrival that the farm was the only remaining such facility that still carried the title experimental farm, not research station. He contacted Ottawa to request that Charlottetown henceforth be elevated to that status. Upon review by senior managers, the request was approved. From that time on, the farm was called Charlottetown Research Station.

Early in Dr. Russell's administration the farm's library was transferred from its location in Ravenwood House to the basement of the former Science Service Laboratory building. This made books and periodicals more easily accessible to staff than they had been in their former location. But Dr. Russell's most important contribution to the station was almost certainly the introduction of corporate management, which brought Section Heads into the area of decision making on a regular basis. Dr. Russell encouraged senior staff to assume a leadership role and endeavored to keep staff informed of policies and decisions through regular professional staff meetings.

No new staff came on strength during 1967 but one long-term staff member left the station. In May, apiarist Warren Burns, who was a full-time employee at Charlottetown since 1928, retired from the department. During his career, Warren also observed and recorded weather data for use by farmers, extension workers, and industry.

Cabot oat developed

The Cabot oat, a variety which was long awaited, was licensed and released in 1967. In developing Cabot, Dick Sterling and Bruce MacLaren crossed Fundy and Garry varieties. The result of this cross was an early maturing oat, which outyielded its parents in most tests. Cabot was equal to Garry in resistance to stem rust but was susceptible to crown rust and smuts.

Spring wheat testing begins

During this period, station researchers began testing spring wheat for the Maritime Provinces. One of the first varieties tested, Kolibri, was developed in Germany. It and several other German varieties tested since then have shown considerable potential for production in the Atlantic region. Cereals grown in the Maritime Provinces are often heavily infected by diseases. Until 1968, however, there was no one at the station to study these diseases, which could result in the loss of many thousands of dollars during a growing season if left unchecked. In 1968, Dr. Winston Johnston was appointed to study cereal diseases at the regional level. In cooperation with Dick Sterling and Bruce MacLaren, studies were begun on diseases affecting barley and oats. The program was soon expanded to include studies on barley seed quality and vigor, factors that have a marked effect on the ability of cereal plants to resist disease.

In August 1968, Dr. Ron White was named to fill the soil research position, which was vacated by Dr. MacKay in 1966. Working jointly with Doug Munro on potatoes for processing and with Norman Black on corn, Dr. White conducted fertility and management research leading to current regional producer recommendations.

A third position was filled in 1968 with the appointment of Dr. Karl Winter. Dr. Winter replaced Dr. Albert D. L. Gorrill, who transferred to Fredericton Research Station in 1966. Dr. Winter supervised the involvement of the station's herd in the National Dairy Cattle Breeding Project, serving as the project's nutritionist. Other stations involved included Lennoxville, Normandin, Ottawa, and Lethbridge.

Experimental Fur Ranch becomes station's responsibility

In 1968, Charlottetown Research Station became responsible for the management of an experimental fur ranch located in Summerside, 70 km west of the station. The station maintained this responsibility until the ranch was closed in 1969. The following is a summary of the fur ranch's origin:

Prince Edward Island had for many years been a center for silver fox breeding stock. In 1925, however, it was evident that the silver fox farming industry in Prince Edward Island was in serious need of reliable information on the nutritional requirements of these animals. Sound methods of controlling internal and external parasites and a better understanding of the various fur-inheritance factors were also needed. The Canadian Silver Fox Breeders' Association, therefore, urged the federal government to launch a comprehensive investigation of these problems at the local level, and an experimental fur ranch was established.

Prior to the establishment of the Experimental Fur Ranch, silver fox research was conducted by the Advisory Council for Scientific and Industrial Research in cooperation with the Health of Animals Branch, Hull, Que.

The Silver Fox Breeders' Association assisted the department with the construction of the fur ranch on land that had been donated by Prince Edward Island businessmen. Twenty-five pairs of registered silver foxes were donated by local breeders to begin the operation. The ranch became the responsibility of the Experimental Farm Service, Ottawa. Mr. G. Enris Smith was named the ranch's first Superintendent in 1925. He was followed, in 1941, by Dr. Charles K. Gunn, who directed the ranch's activities until his retirement in 1968. At that time, the ranch was placed under the direction of Charlottetown Research Station. One secretary and two general laborers from the ranch staff were transferred to Charlottetown Research Station. The ranch was officially closed in April 1969.

Comprehensive Development Plan introduced

In 1969, the Department of Regional Economic Expansion (DREE) instituted a development strategy for the province that would help stimulate the agricultural industry as well as other primary and secondary industries.

A Federal–Provincial Advisory Board was given responsibility for management of the development plan. To advise the Board on agricultural research projects being conducted under the plan, an Agricultural Research Committee was formed, composed of senior management level federal and provincial staff.

Because agriculture is Prince Edward Island's largest single industry, this sector received a large proportion of the developmental assistance under the plan. Agriculture was, in fact, termed the "economic engine" of the plan. In addition to help at the farm, extension, and marketing levels, the plan allotted $3.75 million for agricultural research to strengthen the capability of Charlottetown Research Station. Dr. Russell, the Director, in cooperation with senior federal and provincial staff, began drawing up detailed specifications for offices, laboratories, and so forth, to be housed in a new, urgently needed building. The cost of this new complex, to be used jointly by research station staff and employees of the Prince Edward Island Department of Agriculture and Forestry, would be shared by the federal and provincial governments. Plans for the building were finalized in 1970.

Appointment of Dr. Glen C. Russell as Director, Harrow Research Station

Late in 1969, it was announced that Dr. Glen C. Russell had accepted the position of Director, Harrow Research Station, effective early in 1970. Dr. Lloyd B. MacLeod was selected to replace Dr. Russell as Director, Charlottetown Research Station. Because of the impending change in Directors, Drs. MacLeod and Russell represented the station at the Agricultural Research Committee's second formal meeting, which was held in January 1970. Decisions were made to recommend financing of four new staff positions at the station. These included an agricultural economist, a cereal researcher, a forage management researcher, and a small-fruit technologist. Funds for architectural fees and for certain other building costs were also recommended.

Early in 1970, Dr. Russell, who had participated in the early planning stages of the Comprehensive Development Plan, left the station to assume his new duties at Harrow.

right

Dr. Charles K. Gunn, Superintendent, Experimental Fur Ranch, shows Princess Elizabeth and Prince Philip an exhibit of foxes and mink from the ranch during the royal couple's visit to Charlottetown in 1951.

CHAPTER 14

Charlottetown Research Station—1970–1983

above
Dr. Lloyd B. MacLeod, Director, 1970–

Many managerial and administrative changes took place during the 1970s and early 1980s. During this period, Management by Objectives was introduced. This management style included the identification of objectives and goals, assignment to employees of definite responsibilities geared to the goals targeted, and the use of these goals as guides to measure success.

New decade brings new director

Dr. Lloyd B. MacLeod was appointed Director, Charlottetown Research Station in February 1970. In his new capacity, Dr. MacLeod continued Dr. Russell's policy of administration through corporate management. As the months went by, Lloyd MacLeod further intensified this process, delegating increased responsibilities to senior staff and committees. A staff Climate Survey conducted early in Lloyd MacLeod's directorship indicated that the system used to transmit information from station management to subordinate staff was not satisfactory. As a result of this survey, certain policies were changed. Minutes of Section Head meetings were circulated to all professional staff. Professional meetings were held more often than before, although general staff meetings were held only occasionally.

During Dr. MacLeod's administration, tasks were delegated more than ever before. Section Heads were responsible for administering overall areas of research. Within these areas, Program Leaders were designated responsible for planning research activities involving specific commodities. Dr. MacLeod felt that strong involvement by staff in all areas of administrative decision making made good sense. Committees were formed and by 1983 there were about 20 different areas of responsibility administered by committees.

The station's increasing research specialization and broadening of responsibilities made the task of administration more and more complex. Recognizing this situation, Dr. MacLeod named Dr. Carl Willis in 1977 as Assistant Director. Carl Willis relinquished his former position as Head, Forage Section, and assumed a variety of administrative, personnel, and program duties.

Comprehensive Development Plan (CDP)

The Comprehensive Development Plan was to be administered in three, 5-year phases, 1969–1974, 1974–1979, and 1979–1984. Funds initially allocated through the federal government's Funds for Rural Economical Development (FRED) offered the station many opportunities for increased research capability. The challenge was to channel these funds into areas where they could most benefit agriculture. To ensure that maximum benefit was being derived from the resources assigned to the research component of the plan, Dr. MacLeod was required to report to the Agricultural Research Committee each year on progress made by the CDP-funded research programs.

During Phase One (1969–1974), a number of professional and technical staff were hired at Charlottetown.

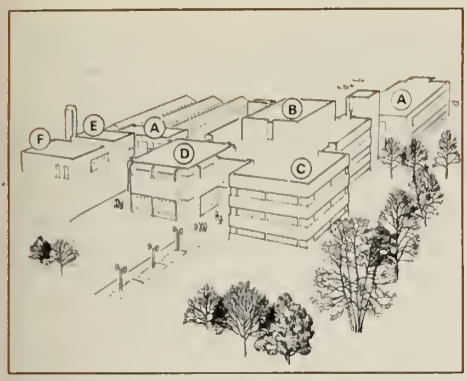
In 1970, Dr. Jim H. Lovering, an economist, came to the station to do research on agricultural systems and to provide economic assessment of research priorities. He was later made Head of the newly formed Crop Livestock Systems Section.

A cereal breeder, Dr. Hans G. Nass, joined the station staff in 1970. In keeping with the trend toward stepped-up cereal production research, Dr. Nass was to study problems related to wheat physiology and breeding.

In 1970, Dr. H. Tapani Kunelius was appointed to conduct research on forage management, working mainly on forage grass and legume management but also on species and cultivar evaluation.

As well, a small-fruit technologist was hired to initiate projects at several locations with strawberry, raspberry, highbush blueberry, lowbush blueberry, grape, and sour cherry varieties.

In 1971, after recommendations for additional staff were approved at the Agricultural Research Committee level, weed control scientist, Dr. Jerry A. Ivany, was appointed to the station. Dr. Ivany was the first full-time weed control scientist to work at the station, although limited weed studies had been conducted previously. A processing potato quality technologist was also appointed for a 5-year term. He was given responsibility for studies on the fertility and management of processing potatoes.



left

Architect's illustration of new Agricultural Research Complex completed in 1972. *A*. Existing laboratory building, headerhouse, and greenhouses. *B*. New laboratory office complex, research laboratories, and Provincial Service Laboratories. *C*. Administrative and Extension Office wing. *D*. Conference room, lunch room, and kitchen (1st floor), library (2nd floor). *E*. Heating plant. *F*. Provincial Veterinary Laboratory and Services.

below

The Honourable H. A. (Bud) Olson, Minister of Agriculture (*left*), putting the finishing touches to the installation of the cornerstone at the official ceremony in June 1972, with the assistance of Premier Alec Campbell (*center*) and the Honourable D. A. MacDonald, Minister of Agriculture for Prince Edward Island (*right*).

Phase Two (1974–1979) brought additional staff on strength. In all, the Agricultural Research Committee approved funding for the creation of three new research positions, including an agricultural engineer, a cereal disease researcher, and a soil management researcher, and one new information officer position.

In 1976, the research positions were staffed. Mr. Allan J. Campbell, agricultural engineer, came to the station to conduct farm machinery studies in cooperation with the engineers at Fredericton Research Station. He was the first agricultural engineer employed by the station. Dr. Katherine Clough was hired in 1976 to conduct research on diseases of barley. Also in 1976, the station appointed Dr. John Sadler to conduct soil management studies related to the effects of tillage, pesticide accumulation, and so forth, on soil productivity.

In 1977, the Information Division of Agriculture Canada agreed to the provision of an information officer position at the station. Funded through the CDP, the position was designed to facilitate the flow of useful research information to the agricultural community. Mr. Steve Knight was selected for the position. In addition to these positions, a corn technologist position was also created and staffed under Phase Two.

In total, CDP funds brought nine technical support staff positions to Charlottetown, in addition to four person years for casual employees. This brought the total number of full-time CDP-funded person years to 21, plus a 5-year term technologist. This increase in staff and in research activities meant the station required more land. This objective was achieved in the 1970s and early 1980s by renting additional land from producers throughout the province on a short-term basis.

Under Phase Three (1979–1984), federal funds were allocated to the station to conduct technology transfer projects. These projects, which demonstrated results of agricultural research in on-farm demonstrations, were conducted by producers in cooperation with station research scientists and with provincial extension workers.

Agricultural Research and Extension Building built

The additional staff and programs introduced under the terms of the CDP resulted in the need for enlarged office and laboratory facilities.

The Agricultural Research and Extension Building, built in 1971–1972 as an extension to the station's existing research laboratory (the former Science Service building), was a welcome addition. The building was financed jointly by the Canada Department of Agriculture, the Department of Regional Economic Expansion, and the Prince Edward Island Department of Agriculture and Forestry under the Prince Edward Island Comprehensive Development Plan. The complex, which measures nearly 70 000 m^2 in area, was designed by Public Works Canada. Prior to his departure for Harrow in 1970, Dr. Russell initiated the planning process to predict additional space and facilities required. In addition to Dr. MacLeod, Dr. R. Anthony (Tony) Ludwig, Assistant Director General, Administration, and Mr. Walter Cunningham, Architectural Engineering, Administration, represented Research Branch in planning the building project. Originally, $1.5 million had been allocated for the completion of the Agricultural Research and Extension Building.

In 1971, during a visit to the research station to discuss proposed building plans for the new complex, Premier Alec Campbell invited the Honourable Jean Marchand, Minister of the Department of Regional Economic Expansion, to push the lever to pour the first concrete at the building site.

above
The Agricultural Research and Extension Complex was completed in 1972.

above right
The lobby of the new complex was designed to be both inviting and efficient.

center right
The open space concept was used in designing the Administrative Office area.

below right
When the Agricultural Research and Extension Complex was built, laboratories in the former Science Service Laboratory building were redecorated and new facilities installed.

opposite page • above
A three-section conference room was provided for use by staff and agricultural groups.

opposite page • center
Premier Alec Campbell addressed public and platform guests at the official opening of the Research Complex in July 1973. *From left*: W. S. MacFarlane, Department of Regional Economic Expansion; S. B. Williams, Deputy Minister, Agriculture Canada; the Honourable Eugene F. Whelan, Minister of Agriculture; Dr. Lloyd B. MacLeod, Director, Charlottetown Research Station; Norman MacLeod, Williams, Murphy, and MacLeod Ltd. (contractor); and Bruce Angus, Director, Public Works, Altantic Region.

opposite page • below
Premier Alec Campbell, *left*, and the Honourable Eugene F. Whelan, *right*, cut the official ribbon.

During the construction of the research complex, accommodations had to be arranged for staff. Some were moved to the Horticulture Building, others to the Administration Building. A greenhouse–headerhouse building was expanded to provide temporary office space for other professional staff. Provincial staff were housed temporarily at Williams House, a station property situated east of Ravenwood House. Construction proceeded well, and on 26 June 1972, the Honourable H. A. (Bud) Olson, Minister of Agriculture for Canada, laid the cornerstone. This coincided with the annual conference of the Agricultural Institute of Canada, which was being hosted in Prince Edward Island that year.

In November 1972, the new building was ready for occupancy. Areas that had provided temporary housing for research staff reverted to their intended use as work and storage areas. When provincial staff moved into the new building, Williams House was demolished.

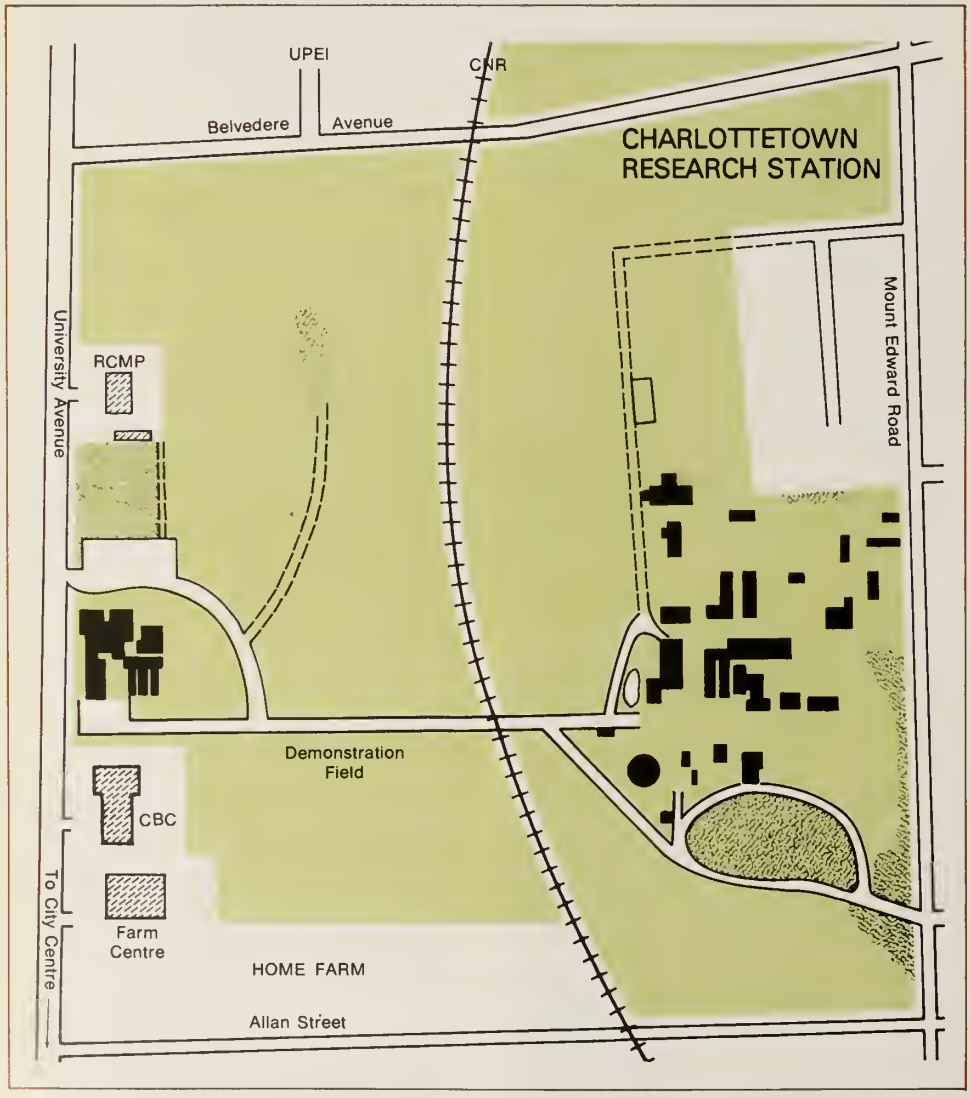
Official opening ceremony

On 24 July 1973, the Honourable Eugene F. Whelan, Minister of Agriculture, officially opened the Agricultural Research and Extension Building. Dr. Lloyd B. MacLeod and Mr. Merle W. White, Deputy Minister, Prince Edward Island Department of Agriculture and Forestry, co-chaired the event, which was held at the entrance to the new building. Platform guests included the Honourable Alec B. Campbell, Premier and Minister of Agriculture for Prince Edward Island; the Honourable Gordon L. Bennett, Minister of Justice and Attorney General for Prince Edward Island; His Worship Elmer M. MacRae, Mayor of Charlottetown; Chief Justice C. St. Clair Trainor; Mr. R. Bruce Angus, Atlantic Regional Director, Department of Public Works; Mr. W. S. MacFarlane, Acting Director, Department of Regional Economic Expansion; Right Reverend P. F. MacDonald; Archdeacon G. S. Tanton; and Mr. Norman MacLeod, Vice President, Williams, Murphy, and MacLeod Ltd. (the general contractor).

Following the ribbon cutting by Mr. Whelan and Mr. Campbell, platform guests and the general public toured the new research and extension complex.

Costs shared

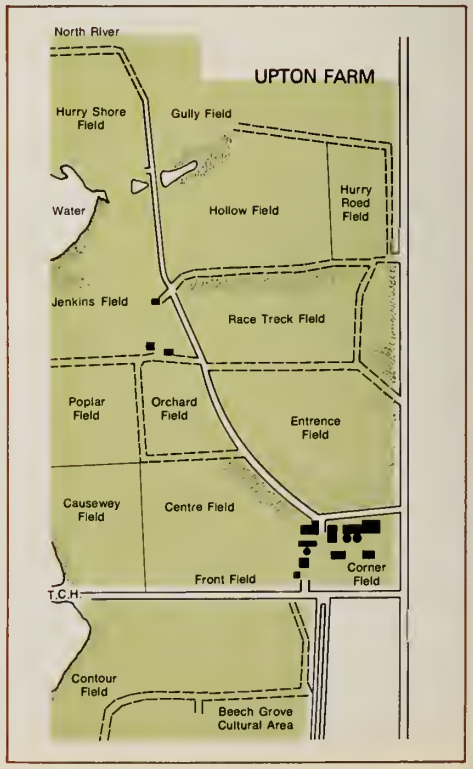
Charlottetown Research Station was one of the first federal agricultural research establishments in Canada to share facilities with a provincial department of agriculture. By agreement, operating costs were assumed by each establishment on the basis of space occupied (approximately two-thirds federal and one-third provincial). To ensure smooth operation and effective integration of staff functions in the complex, a Federal–Provincial Building Management Advisory Committee was established, which met regularly in the early stages of the building's occupancy, but later on only as necessary.



Branch decentralized

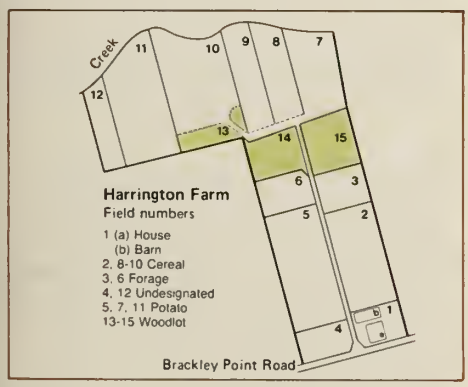
In 1978, the department underwent a process of decentralization. Research Branch was restructured to place greater authority and responsibility in the various regions of Canada. Consequently, Quebec and the Atlantic Provinces constituted the Eastern Region, with offices located in Sainte-Foy, Que. The Eastern Region Committee of Managers (the Director General and the Directors of all Quebec and Atlantic Provinces research stations) evaluated, planned, and established priorities for research being conducted in the region. In 1978, the department named Dr. Lloyd MacLeod as Chief Liaison Officer (CLO) for Prince Edward Island. His responsibilities as CLO were to improve levels of communication and cooperation between the department and the provincial government as well as components of the food and agriculture industry.

During Dr. MacLeod's term in the dual role of Director, Charlottetown Research Station, and CLO, he delegated many of the Director's responsibilities to Dr. Carl Willis, who earlier was named Assistant Director. In 1980, the branch structure was further altered when Eastern Region was divided to form Quebec Region and Atlantic Region. The Atlantic Region's office was established in Halifax, N.S. Dr. E. Edward Lister, formerly Assistant Director,



Animal Research Institute, Ottawa, and later Program Specialist, Central Region, was named Director General, Atlantic Region. Dr. Bill Collins, former Program Leader, Potato Research Program at Fredericton Research Station, was named Atlantic Region's Program Specialist. In 1981, Dr. Lloyd MacLeod relinquished his duties as Chief Liaison Officer.

In addition to the new research complex, many visible changes were in evidence at Charlottetown during the first decade of Dr. MacLeod's direction. One such accomplishment took place in 1970–1971, with the rerouting of roadways at the home farm and at Upton Farm. Schurman Drive, the private roadway that ran through the station property, was used extensively by the public. This roadway was named after Dave Schurman, former Assistant Superintendent in charge of Field Husbandry and Forages. The drive, which ran directly across the station, from University Avenue through the service building–office area and exited onto Mt. Edward Road due east of the Director's home, was rerouted to its present location, south of Ravenwood House and its front lawn. At the Upton Farm, the crooked, indirect roadway that had been used until the rerouting, was replaced by a modern, paved, arterial roadway, which provided more direct and better access to field research plots and fields.



above right

Recent aerial view of Upton Farm, including dairy research center.

center right

Recent aerial view of the Charlottetown Research Station.

below right

In 1983, the Research Station purchased a new research farm at Harrington, a 90-ha parcel 12 km from Charlottetown. This purchase has reduced the need for rented land to conduct experiments.

above

Starting in the early 1970s, the Charlottetown Research Station has regularly entered a float in the City of Charlottetown's annual Gold Cup and Saucer parade.

Dairy research center built

The Ayrshire dairy herd, which had been housed at the station's headquarters in Charlottetown since the station began, was provided with new housing away from the city limits. This move was in compliance with modern environmental regulations, which discouraged livestock operations in heavily populated areas. The branch approved the construction under a Winter Works Program of a modern dairy research unit at Upton Farm to accommodate the herd. Facilities constructed in 1971 included a modern dairy barn that was equipped to house 50 milking cows plus calves and replacement heifers. There was also a wing for calf nutrition studies. A separate hay barn and two concrete silos were also constructed. When the herd was moved to the new site, the major section of the old dairy barn was demolished. A portion, known as the bull barn, was retained to serve as a vehicle garage storage area. The old dairy was converted to a pesticide storage.

Research summary publication introduced

As in nearly every area of Canadian endeavor, agriculture had undergone tremendous change during the 1950s and 1960s. By the 1970s, the need for practical, up-to-date production information was essential to the farmer. At this time, information on work conducted by the station was made available in press releases, radio and television interviews, scientific papers, and general publications. However, there was no single annual publication on station research to give farmers a comprehensive overview of its work. That changed in 1972 when the station released its first *Research summary*. This publication, which was released each February thereafter, contained the highlights of the previous year's research activities. It rapidly became popular with farmers, extension workers, other researchers, agricultural schools, and agribusiness.

Prince Edward Island centennial projects

In 1973, when Prince Edward Island celebrated its 100th anniversary as a province, the station adopted a special centennial project—the creation of a picnic–barbecue area for use by the public. A former beef loafing barn was converted into a picnic shelter, picnic tables were installed, and the area surrounding the picnic shelter was landscaped. Soon the area became a place for tree plantings by local dignitaries (see Chapter 25, Tree plantings).

Also during centennial year, the Prince Edward Island Federation of Agriculture contacted Dr. MacLeod to propose that a Farm Center be constructed to house a number of farm commodity organizations and agricultural groups. Dr. MacLeod, who favored the idea of centralized agricultural services, requested approval from the branch and department in Ottawa to lease station land to the group on a long-term basis so that such a facility could be constructed. Approval was granted and the Farm Center, which serves the needs of the farming public, was completed in 1975.

Charlottetown Research Station—the staff

By 1983, there were 27 professional staff at Charlottetown Research Station. Since 1970, there have been many new staff appointments and retirements, and, sadly, two deaths.

left
When Dick Steele (*left*) and Bob Cameron (*right*) retired from the Charlottetown Research Station in 1977, their combined service tallied 98 years! Dick's 50 years of service was a new Branch record, whereas Bob's 48 years of service tied the former Branch record.

The untimely passing of Keith LeLacheur in 1977, came as a shock to all the staff. Keith's skills and leadership qualities in the area of tobacco research had won him the support of producers region wide. At the time of his death, his duties included the development and supervision of the region's tobacco research, including fertility and management, in addition to coordinating experiments on tobacco diseases, insects, and nematodes. When he died, industry representatives said one of his most important contributions was his ability to win grower confidence—resulting from his capacity to "sort out facts from myths, real opportunities from imaginary ones."

Two years later, potato researcher Doug Munro died at the age of 44. During his 20 years of service to the industry, he made countless contributions. In later years, Doug was responsible for major studies in the development of production technology for small whole seed potatoes. He was more than just a talented researcher, however. His ability to write clearly for a wide range of agricultural audiences, was undisputable.

In 1972, Mrs. Ruth (Toombs) Baldwin, for many years the Office Manager as well as Secretary to the Director, was asked to devote full time to the duties of office management, which had grown along with the institution itself. Mrs. Lane Sampson was appointed Secretary to the Director, a position she has held since 1972.

Several researchers retired during this time: Bruce MacLaren (1970); Fred Cannon (1970); George Ayers (1974); Lorne Callbeck (1976); Norman Black (1977); and Phil MacKinnon (1977).

New professional appointments during the period, excluding Comprehensive Development Plan (CDP) appointments, included the following: Dr. John MacLeod, cereals and forage (1971); Dr. Kailash Sanwal, transferred from the Biosystematics Research Institute, Ottawa, nematodes (1971); Dr. Joe Kimpinski, nematology (1972); Dr. D. G. Russell, seconded from Economics Branch, Ottawa, economics (1973); J. Brian Sanderson, winter wheat, protein crop production (1973); Phil MacKinnon, transferred from Fredericton Research Station, potato virus research (1973); Dr. John G. McDonald, potato virology (1978); Dr. Thin Miew Choo, red clover breeding (1978); Dr. Pushpal Narasimhalu, forage conservation, utilization, and quality (1979); Dr. Harold Platt, potato diseases (1978); Walter Arsenault, tobacco research (1981); and Dr. Martin Carter, transferred from Vegreville Experimental Farm, minimum tillage research (1983).

During the same period, there were several changes among the professionals funded under the CDP research component. These included Dr. Katherine Clough, who resigned in 1978. Her position in cereal pathology research was refilled in 1980 by Dr. Richard Martin. Dr. John Sadler transferred to Brandon Research Station in 1981 and the position in soil management was filled by Dr. Linnell Edwards in 1982. In 1981, Mr. Steve Knight resigned from the Information Officer position and Mrs. Mary B. Bourdon was appointed to this position the following year. Also in 1981, Dr. Jim Lovering transferred to the Regional Development Branch. In 1983, Mr. Rollin Andrew was hired to replace Jim Lovering as Research Economist. Also, in 1983, John Enman was hired to promote transfer of research technology to the agricultural industry.

CHAPTER 15

Cereal studies

During recent times, the cereal program at Charlottetown experienced the greatest increase in staff, benefiting more than any other program from the Comprehensive Development Plan. CDP-funded staff and those recruited through the branch worked together to improve the region's cereal production.

Spring wheats developed

Dr. Hans Nass developed a spring wheat breeding program using the facilities at Charlottetown and at Normandin Experimental Farm in Quebec. As a result, several new spring wheat varieties were developed for use in the Atlantic Region. Originally, Dr. Nass's responsibility was to breed improved spring wheat varieties for the Eastern Region (Quebec and the Atlantic Provinces). After the departmental reorganization, however, Quebec assumed responsibility for development of its own spring wheat varieties. Regardless, Dr. Nass continued to participate actively with Quebec in this work. Spring wheats developed by the station since 1970 include Dundas, Vernon, and Milton. The varieties Vernon and Milton are resistant to powdery mildew.

above

Cereal production field day, Charlottetown (1970)

Winter cereals

Winterkill poses a serious threat to production of winter cereals in the Atlantic Region. Dr. Michio Suzuki conducted freezing tests on winter cereals, which showed that fall rye had greater resistance than winter wheat and that a wide range of variation in freezing resistance occurred among wheat varieties. He explained the variation in terms of carbohydrate components, because varieties with higher resistance contained more fructosan than varieties with lower resistance.

Three barley varieties developed

In 1974, Kinkora, the only known commercial barley variety resistant to the barley jointworm, was developed by Dick Sterling. Although this barley answered the producer's need for a jointworm-resistant variety, the plant had large awns, which made harvesting difficult. The search for an improved variety continued. In 1977, Atlanta barley was introduced. This two-rowed variety had high yield and good resistance to lodging. In 1983, another two-rowed type of barley named Micmac was developed by Dick Sterling. It was licensed and recommended for use in the Atlantic Region. It is characterized by having high yielding potential.

Disease and pest control

In 1968, Dr. Winston Johnston began research on cereal diseases occurring in the region. Initially, root rot of barley and *Septoria* on oats were studied. Later, when Dr. Katherine Clough was hired, the emphasis changed with the strengthening brought about by her arrival. During her stay at Charlottetown she initiated epidemiological and control studies on several barley leaf diseases. When Dr. Richard Martin was appointed in 1980 to the position formerly occupied by Dr. Clough, the cereal disease research program underwent a reevaluation. Previously, Winston Johnston and Katherine Clough each had responsibility for researching a range of diseases in one or two cereal families. When Richard Martin joined the staff, the cereal disease program was divided on the basis of disease and type of loss being experienced by cereal growers.

In 1981, Dr. A. (Tony) V. Sturz became the first National Research Council post-doctorate fellow at Charlottetown Research Station. Dr. Sturz spent 2 years studying *Fusarium* in cereals.

Dr. Jerry A. Ivany initiated a research program in cereal weed control research in the early 1970s. Dr. Ivany investigated factors affecting herbicide activity and crop response to herbicides. He also studied herbicide residues and their buildup in soil and effects on rotational crops. Dr. Ivany also developed an efficient method of quackgrass control using a fall herbicide treatment. This method was considered particularly useful in Prince Edward Island, where the weed is a strong competitor with crops. Applying herbicide in the fall permitted farmers to achieve control of the troublesome weed with no delay in planting the following spring.

Dr. Leith Thompson devoted considerable time during the 1970s to evaluating oat and barley lines and cultivars for tolerance to the aphid-transmitted barley yellow dwarf virus disease. Information on lines and cultivars with tolerance to the disease was passed on to cereal breeders.

In the early 1970s, Dr. Joe Kimpinski demonstrated that nematodes could cause yield losses in cereals. Investigations were conducted to determine the interrelationships between root-lesion nematodes and the fungi causing root rot.

Fertility and soil management

In 1971, Dr. John MacLeod assumed responsibility for research on nutrition and management of cereals. At that time, a fertilizer injury problem was prevalent in cereals. Upon analysis, John MacLeod determined that this problem resulted from a high concentration of ammonia in root zones. He hypothesized that the diammonium phosphate–urea combination farmers were applying to crops caused the release of ammonia. Under dry, sandy conditions, ammonia built up at a critical time in the growth cycle of cereals, resulting in tissue injury. Following 3 years of field plot research, this conclusion was confirmed. Appropriate recommendations were incorporated into crop guides.

In June 1977, members of the station staff, including Dr. Lloyd MacLeod as leader, and Drs. Lovering, Nass, and Johnston, plus Don Bates, the Cereal Extension Specialist from the Prince Edward Island Department of Agriculture, and Jock Peill, a cereal producer from the Annapolis Valley, embarked on a cereal research mission to the United Kingdom, the Netherlands, and West Germany. They returned with extensive information on cereal production, particularly on the use of growth regulators for lodging control and fungicides to control disease. As a result of this mission, a multidisciplinary project was established at the station to study intensive cereal crop production. John MacLeod and Winston Johnston, who participated in the follow-up, concluded that growth regulators could improve production of winter cereals in the region, particularly when used in combination with fungicides and high levels of nitrogen.

In 1976, Mr. Allan J. Campbell began to evaluate minimum tillage practices. In 1983, he went on educational leave to study minimum tillage.

During the mid-1970s, Dr. John Sadler began conducting research on the long-term implications of tillage methods, pesticide carryover, crop rotation, and so forth. After John Sadler's transfer to Brandon, Man., in 1981, Dr. Linnell Edwards joined the staff. Linnell's responsibilities included developing systems for reducing soil erosion and assessing the effects of differing crop and soil management practices on soil stability.

In 1983, a minimum tillage research position was filled by Dr. Martin Carter, who began to evaluate the effects of tillage methods and crops on soil structure and productivity.

above right

Harvesting spring wheat plots at Charlottetown.

below right

Winter survival of perennial forage crops and winter cereals is often variable, as illustrated in this photo of fall rye taken in May 1976.

CHAPTER 16

Forage studies

above right

Annual ryegrasses show promise as mid- to late-season forages in Atlantic Canada.

below right

Bromegrass plots: Nitrogen fertilization greatly increased yield and protein content of grass forage. Plot in center received no nitrogen. Plots on either side were nitrogen-fertilized.

Charlottetown Research Station has regional responsibility for forage research. As with the station's cereal studies program, forage studies received a boost from staff hired under the Comprehensive Development Plan. This enabled the station to conduct research into areas of forage production it was previously unable to consider. These, combined with the ongoing research efforts of branch-funded staff, proved beneficial to forage production in the region.

Variety evaluation

During the period from 1970 to 1983, evaluation of forage crops was conducted regularly, as it had been since the early years. Until his retirement in 1977, Norman Black assumed the major responsibility for forage variety evaluation.

In the mid-1970s, Dr. Tapani Kunelius, working with provincial extension workers, identified annual ryegrass as having excellent potential for use in livestock production systems in the region. The crop was found useful to the region because it extended the grazing season and provided economical, high-quality feed during the long, cool autumn period. The discovery that annual ryegrass had great potential in the Atlantic Provinces represented a major breakthrough for grassland farming. Dr. Kunelius, in cooperation with extension personnel and the seed trade, promoted the production of this vigorous and versatile crop in the region. Producers readily accepted the advice, and this crop was soon grown by livestock producers throughout the region. Annual ryegrass production has been on the increase ever since.

Physiology of forage crops

Winterkill poses a serious threat to forage legumes grown in the region and the importance of crop winterhardiness was made clear in 1972 when Prince Edward Island experienced one of the most severe winterkills in history. Nearly all susceptible crops were affected. Drs. Lloyd MacLeod and Michio Suzuki maintained that the station should address itself to the selection of more winterhardy crops. Michio Suzuki conducted research on the ability of forage crop varieties to withstand severe weather conditions, and he identified several winterhardy varieties of alfalfa.

Timothy is sufficiently winterhardy for production in the Atlantic Region, but it is slow in regrowth after cutting or grazing. Dr. Suzuki elucidated the chemical structure and molecular properties of fructosan, a major component of carbohydrate reserves and energy source for regrowth in timothy and other forage grasses.

Dr. Suzuki developed several new methods for studying the physiology of forage crops, which included an automatic analysis of total available carbohydrates, a gel filtration chromatography method for isolating fructosan, a viability test method for cold-injured plants, a method for sampling overwintering plants in frozen soil, and a gas–liquid chromatography method for simultaneous determination of volatile fatty acids and lactic acid.

Red clover breeding program initiated

When Dr. Thin-Miew (Alek) Choo came on strength in 1978, Charlottetown Research Station became the only research station in Canada with a full-time red clover breeder on staff. In addition to breeding new varieties, Alek Choo began to investigate factors that affect red clover seed production. Through his efforts and coordination, several superior varieties of red clover have been identified and recommended for use in the Atlantic Region.

above

Sheep-grazing trials are conducted to evaluate the potential of extending grazing seasons with annual ryegrass.

left

Dr. Choo evaluates red clover varieties for use in the Atlantic Region.

Fertility and management

Studies on the management of forages were conducted by Dr. Tapani Kunelius, starting in the early 1970s. Dr. Kunelius developed recommendations on various forage grass production practices. These included intensive management techniques for use in grass production and direct seeding of forages. These techniques have been used widely as regional crop management recommendations since the late 1970s. Likewise, Tapani Kunelius worked on no-till pasture renovation to rejuvenate rundown pastures and haylands. This technique was demonstrated successfully on several farms. A lime-Mo-*Rhizobium* coating for alfalfa seed, which was shown to improve the level of seedling establishment in low pH soils, was also developed by Dr. Kunelius.

From 1979 to 1980, Tapani Kunelius participated in a work transfer program, at the Grasslands Division of the Department of Scientific and Industrial Research in Palmerston North, New Zealand. During his stay there, he studied innovative pasture management techniques being developed or used, including pasture renovation practices. Upon his return, Dr. Kunelius discussed his experiences at a number of sessions designed to inform the farming public of these new developments.

In the early 1970s, Dr. John MacLeod began to study urea and its effect on forage crops. He adapted a technique used in the Scandinavian forest industry to measure ammonium losses in on-farm fertilizer applications. After careful observation, Dr. MacLeod concluded that urea was suitable for use on forages during cool weather, but its use during warm weather was not advisable.

Research on the micronutrient requirements of forage crops was also pursued during the 1970s. Based on field experiments, Dr. Umesh Gupta worked out the application rate of boron required to maintain adequate levels for alfalfa and red clover.

When Dr. Pushpal Narasimhalu was appointed to the staff in 1979, he conducted experiments on the quality of forages. He assessed quality loss experienced during field wilting. As well, he developed prediction equations to estimate forage quality and began devising new methods for preparing and conserving high-quality forages. He developed a rapid method for measuring levels of dry matter in forages using a microwave oven, and demonstrated relationships among forage consumption, digestibility, and several in vitro chemical measurements in hays and silages.

Pests and pest control

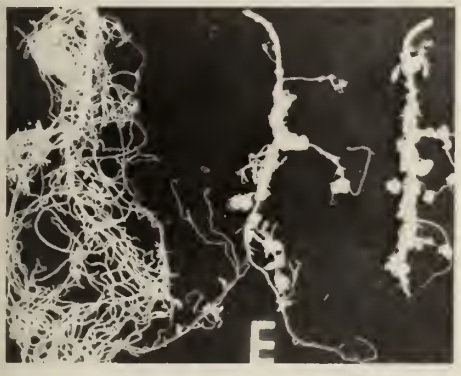
In 1971, when Dr. Kailash C. Sanwal was appointed to the staff, he continued the work begun by Drs. Willis and Thompson, who had determined that nematodes were responsible for significant yield re-

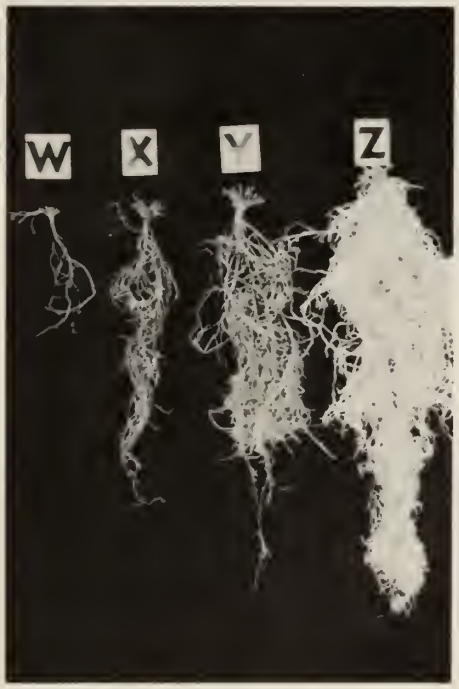
above

Pasture renovation studies are of prime concern at Charlottetown.

right

Management of timothy affects weed infestation and persistence of this crop.





above

Modern methods of conserving hay in large round bales retain quality.

below

Healthy forage legume root (*left*) and root-knot nematode-affected roots (*right*).

right

Effect of increasing numbers of root-lesion nematodes on bird's-foot trefoil roots. Root (*z*) has no nematodes.

ductions in forage legumes and had investigated which nematicides were most effective in controlling nematode infestations in forage crops. Dr. Sanwal spent 1 year at Charlottetown Research Station setting up a nematology research laboratory. When he resigned, his position remained vacant for a short time before Dr. Joe Kimpinski came to the station. Dr. Kimpinski, in cooperation with Dr. Willis, studied nematode–fungal interactions.

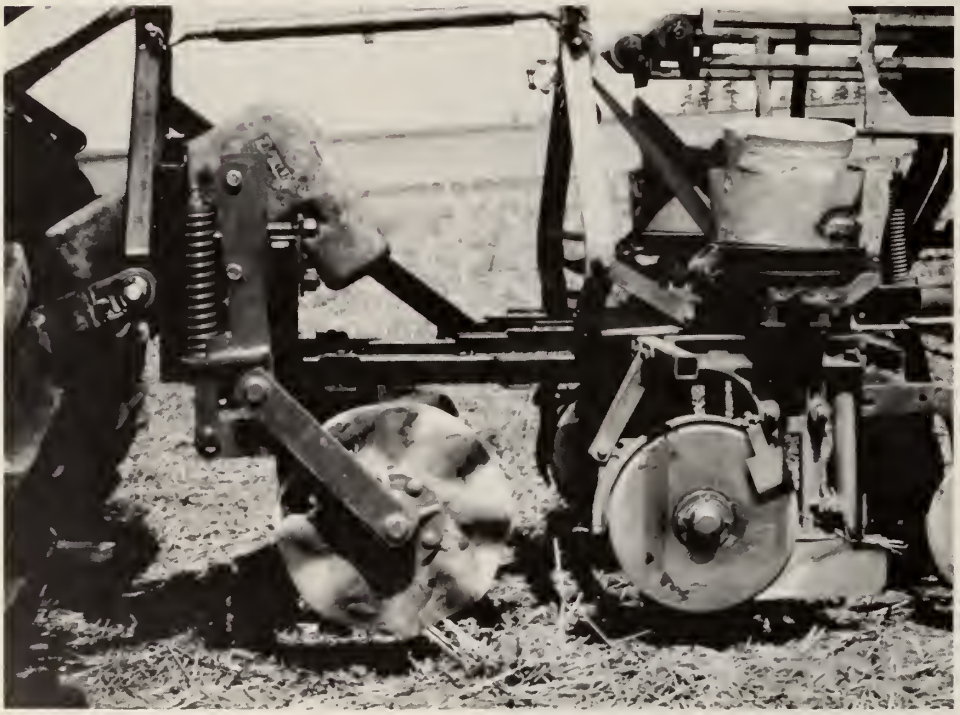
In 1974, Drs. Suzuki and Willis showed that nematode infestation decreased the cold hardiness of alfalfa.

Dr. Leith Thompson studied the life history ecology and control of two important forage pests, the European skipper and the alfalfa blotch leafminer. He introduced biological control methods that reduced significantly the status of these insects as economic pests of timothy and alfalfa, respectively.

CHAPTER 17

Corn studies

Shortly after joining the station in 1968, Dr. Ron White initiated studies on the fertility requirements for corn production on Prince Edward Island. Mr. Norman Black cooperated in some of these studies. The results were used to formulate soil test recommendations for corn. In the mid-1970s, Dr. White's corn research emphasis shifted to studying field management practices for both silage and grain corn production. Research results provided recommendations on planting and harvesting dates, plant populations, and tillage. One notable series of experiments, first involving the cooperation of Drs. Kunelius and Winter, and later that of Drs. Narasimhalu and White, demonstrated substantial losses in yield, nutrient value, and animal feed quality when silage corn harvest was delayed until after a killing frost.



left
This no-till corn planter was developed at the Charlottetown Research Station and is an inexpensive modification of a conventional seeder.

Prior to about 1975, Norman Black conducted the evaluation of corn hybrid performance. Dr. Ron White then became responsible for this work and played a significant role in revising and unifying corn hybrid evaluation on a regional basis, with the help of Dr. Ken MacRae, the regional statistician, and others in the regional hybrid evaluation program. Dr. White's proposal for a simple performance index rating that would identify superior hybrid performance in both yield and maturity was refined and put into use in the region.

Dr. Jerry Ivany developed successful weed control programs and quantified the detrimental effects of weeds at various stages of corn production.

Dr. Leith Thompson identified and evaluated several insecticide methods for the successful control of European corn borer. However, control of this insect did not improve silage corn yields, although later studies demonstrated some grain yield improvement.

CHAPTER 18

Vegetable studies

left
Onions are studied at the Charlottetown Research Station to determine the benefits of their production on a commercial scale.

below
Carrot rust fly control with insecticides (Example *A*).

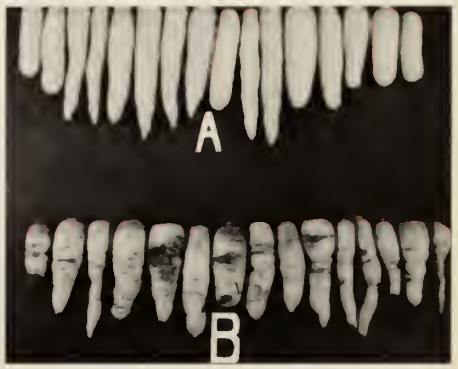
Production of vegetables was extensive in the early 1970s: three vegetable freezing plants and one canning plant were operating in the province. Studies started earlier by Mr. Jack Cutcliffe on the fertility requirements of cole crops were continued. Jack Cutcliffe elucidated factors causing hollow stem in broccoli, and determined the stage of development to top brussels sprouts for maximum yields. He also defined the effects of plant spacing and fertility on processing peas, and evaluated cultivars of several vegetable crops.

Jack Cutcliffe, in cooperation with Dr. Umesh Gupta, identified the boron requirements of several vegetable crops. For example, they demonstrated that brown heart of rutabaga could be controlled more consistently by spray applications of boron than by the former method of adding the boron with the fertilizer. Dr. Gupta developed a simple and rapid technique for the determination of boron in soil, which enabled the analysis of a large number of samples daily. Jack Cutcliffe also demonstrated the feasibility of producing field beans and onions on a commercial scale in Prince Edward Island.

In cooperation with Jack Cutcliffe, Dr. Michio Suzuki conducted studies on rutabagas in relation to eating quality. They found that rutabagas contain levels of sugars as high as 60 percent of dry weight, and that good-quality rutabagas can be obtained if harvested when maximum sugar accumulation occurs, normally in October.

Pests and pest control

Recent pest control studies in vegetables at the station included work by Drs. Read and Kimpinski. For example, Dr. Dean Read defined measures for the control of the cabbage maggot in rutabagas. His research emphasized factors in the soil environment that influence the efficacy of insecticides, such as soil texture, acidity, and microorganism, which become adapted to degrade specific insecticide compounds. Nematode infestations, a growth obstacle to many crops in the region, remained under study throughout the 1970s and early 1980s.



CHAPTER 19

Small-fruit studies

During the years 1970–1983, small-fruit studies at Charlottetown Research Station continued to emphasize variety trials, fertility, management, and pest control. The station's small-fruit technologist conducted tests with strawberry, raspberry, highbush blueberry, lowbush blueberry, grape, and sour cherry, and found that strawberry and lowbush blueberry demonstrated the best production potential for Prince Edward Island. Advances were made in the chemical control of weeds affecting these two crops and methods were identified for establishing lowbush blueberry, using selected high yielding clones. During the early 1980s, small-fruit studies at the station were aimed mainly at increasing lowbush blueberry yields through the development of improved management practices.

CHAPTER 20

Protein crop studies

In 1974, a soybean variety testing program was initiated at Charlottetown Research Station. Mr. J. Brian Sanderson, in cooperation with soybean breeder Dr. H. D. Voldeng, Ottawa Research Station, began testing soybean varieties under cool, moist Maritime conditions. Maple Presto, a variety developed at the Ottawa Research Station, was high yielding and sufficiently early to mature. When Brian Sanderson went on educational leave (1978–1980), Dr. John MacLeod assumed responsibility for soybean variety evaluation and management. Technology transfer projects funded by the Department of Regional Economic Expansion were begun under the direction of Dr. MacLeod. One such project was to evaluate the commercial potential of Maple Presto in the region. This project and others like it were conducted as a cooperative effort of researchers, producers, and extension workers. Subsequent variety evaluation by Dr. MacLeod identified Maple Amber as a soybean variety with potential for the region.

above

Soybean varieties are evaluated at the Charlottetown Research Station.

CHAPTER 21

Tobacco studies

Throughout the 1970s and early 1980s, Charlottetown Research Station's tobacco program continued to emphasize improvements in plant yield, quality, fertility, and other aspects of crop management. During the 1960s and 1970s, tobacco yield in the region increased more, percentagewise, than that of any other crop in the Maritimes. This achievement could be attributed largely to the well-coordinated efforts of the station's research program, under the direction of Keith LeLacheur. After Mr. LeLacheur's death in 1977, a tobacco technologist was appointed. In 1981, Mr. Walter Arsenault who had filled the position as technologist was appointed Tobacco Biologist, and in this capacity he conducted research on tobacco and maintained contact with tobacco producers in the region, helping them in every manner possible to improve tobacco yield and quality.

Following extensive tests conducted at Charlottetown Research Station, a tobacco variety developed at Delhi Research Station was recommended for the region in 1981. Islangold, which was better quality, higher yielding, and more disease resistant than its predecessor Virginia 115, was quickly accepted by the region's tobacco producers. It soon became the most extensively grown tobacco in the Maritimes. Research to refine the crop's nitrogen requirements under local conditions and to develop control measures for black root rot continued.

CHAPTER 22

Potato studies

above left

Potato growers visit the Charlottetown Research Station's experimental plots, 1975.

above right

Early growth of greensprouted Bintje seed tubers (*top*) compared to growth of non-greensprouted tubers (*bottom*) 25 days after planting.

During the 1970s and early 1980s, potatoes continued to be the most important cash crop in Prince Edward Island, with about 25 000 ha in production. At Charlottetown Research Station, responsibility for potato research included the screening of chemicals for weed, insect, and disease control, the evaluation of management and fertility requirements for processing and tablestock potatoes, and, more recently, the study of small whole seed production.

Fertility and management

Extensive studies were conducted in the 1970s by Doug Munro and Ron White to refine the fertility requirements of potatoes, especially for processing. This work demonstrated that growers could reduce fertilizer use and thus lower production costs without reducing yields. It also demonstrated the detrimental effects of high fertility on tuber quality for processing. The findings of field management studies conducted were included in the recommendations compiled for growers.

Mr. Brian Sanderson was appointed to fill the position vacated by the untimely death of Doug Munro in 1977. By this time, the management program was shifting toward studies to identify techniques for the production of small whole seed potatoes (35–65 mm in diameter) for the export market. The increasing world demand for small whole seed meant local growers had to consider providing smaller seed to remain competitive. Dr. Ron White led these studies, along with Brian Sanderson, to evaluate the effect on tuber size of factors such as seed spacing, seed size at time of planting, planting and harvesting dates, and fertility requirements. Dr. Ivany, in cooperation with Messrs. White and Sanderson, conducted studies on the top desiccation problems of early harvested seed potatoes. A concept new to Prince Edward Island potato production was also introduced and evaluated at this time, namely greensprouting, or chitting, of seed prior to planting. The new concept involved presprouting the seed in light to produce short green sprouts. This technique increased maturity and yield for the early harvests necessary for small whole seed production. Studies on the fertility and management of tablestock and processing potatoes by Messrs. Sanderson and White, with emphasis on new varieties such as Shepody, also continued.

left
This tractor-mounted high-pressure sprayer using the drop nozzle system for applying pesticides to potato plots was used from 1950 to 1978.

below left
Under the direction of Dr. Leith Thompson, the cinnabar moth was successfully introduced into Prince Edward Island as a biological control agent of the toxic weed, tansy ragwort.

Pests and pest control

Disease control in potatoes was and is of prime importance to the success of the Island's potato industry. When Mr. Phil MacKinnon transferred to Charlottetown Research Station from Fredericton Research Station in 1973, he played a leading role in the development of the Island's virus-free seed program.

Following his arrival, Dr. John McDonald, who replaced Phil MacKinnon in 1978, worked in cooperation with Dr. R. P. Singh, Fredericton Research Station, to further develop and adapt enzyme-linked immunosorbent assay (ELISA) for postharvest tuber testing for viruses. This method of virus indexing was developed to supplement and potentially replace the Florida Test, the results of which took months to determine. ELISA results are available in a matter of weeks following harvest of the tubers.

When Dr. Harold (Bud) Platt came to the station in 1978, he assumed responsibility for screening chemicals for the control of late blight, seed piece decay, and Verticillium wilt. He also became involved in developing recommendations for the control of storage rot.

In 1981, Dr. Platt participated in an Agriculture Canada mission as part of a Canada–Mexico agreement (Memorandum of Understanding). This mission was undertaken to aid in establishing a working relationship with Mexican scientists under the terms of the agreement. This effort was successful, with scientists from each country releasing the results of their research to the other on an ongoing basis.

Dr. Jerry Ivany defined the appropriate time and rate of application of the herbicides paraquat and metribuzin for best weed control and least crop damage. Responses to these compounds by various potato varieties were also determined. This information provided Island potato growers with a reliable weed control program. Dr. Ivany also conducted studies on chemicals for desiccation of potato tops prior to harvest.

Studies conducted under the direction of Dr. Joe Kimpinski showed that nematodes were causing yield losses in potatoes. Investigations were conducted to determine which methods of control would be most effective in combatting these organisms.

Dr. Leith Thompson initiated potato insect studies in 1982. He investigated potato leaf roll virus control and effects of the potato flea beetle on potato yields.

CHAPTER 23

Livestock studies

Livestock studies at Charlottetown Research Station during the period 1970–1983 concerned the evaluation of pastures, stored forages, and by-products for animal production. Studies on calf nutrition and early weaning were also done, and modeling and analyses of integrated crop–livestock production systems for maximizing net income were actively pursued.

Feed evaluation

Following Norman Black's retirement, Dr. Karl Winter continued studies which demonstrated that native pastures could be as economical a feed source for beef as are seeded grasses, if they are fertilized adequately and grazing is managed carefully. In the early 1970s, Drs. Winter and Gupta launched the Atlantic Selenium Map Project to determine which crops and areas were deficient in selenium, an important trace element. The results of the project revealed that, as suspected, selenium levels are low in most areas of the Atlantic Provinces, and that both forages and feed grains were selenium deficient. However, this trace mineral was not sanctioned for use as a feed supplement at that time. Dr. Winter recommended that the mineral be administered to livestock by injection.

Weaning program developed

Studies by Dr. Karl Winter resulted in the development of a 3-week weaning program for calves, using fermented colostrum. This extremely economical calf-rearing method has rapidly gained in popularity with dairy producers.

Fish silage, fresh waste fish to which fermenting acids are added, is an acceptable protein source for young calves and other livestock. In 1981, Dr. Winter traveled to northern Europe as part of a team to examine how fish silage, a popular livestock feed used mainly for fur-bearing animals and pigs in Scandinavian countries, was made and used. Upon his return, he, in cooperation with Dr. L. A. W. Feltham of Memorial University, St. John's, Nfld., wrote a technical bulletin on the potential uses of fish silage by Canadian livestock producers.

Computer modeling of livestock operations

When Dr. Jim Lovering first came to the station, there were no comprehensive information packages designed to answer economics-related agriculture systems questions. The region's research station Directors suggested the initiation of a study to determine the most economical methods of feeding livestock in Eastern Canada. A study, entitled *The Eastern Canada feed–livestock systems project* recommended the development of computer simulation models of dairy and beef operations for use in evaluating the numerous methods of farm operation. Data for the study plus general assistance were provided by several station staff members. In addition, an agro-climatologist from the provincial Department of Agriculture and Forestry, and researchers at the Fredericton, Sainte-Foy, Lennoxville, and Ottawa research stations, provided data as required. Dr. Lovering also conducted studies on production costs of a number of commodities and optimum equipment sizes for a variety of production systems. When Dr. Don Russell joined the station staff in 1973, he worked with Jim Lovering on the economics of integrated crop–livestock production systems and in identifying priorities for agricultural research.

In 1976, the first computer was introduced at the station. This made systems research much easier to conduct, because there was no longer any need to send data to an outside computer for processing. Drs. Lovering and Russell, as well as many other station staff, made use of this equipment in their day-to-day work.

In 1983, when Mr. Rollin Andrew was hired to replace Dr. Jim Lovering, he continued to conduct cost-benefit analyses on farm systems.

CHAPTER 24

Ravenwood House—the Director's residence

Ravenwood House has a rich and intriguing history.

When Charlottetown was surveyed and laid out in the mid-1700s, the city comprised 110 ha of building lots and 230 ha common.

The 230 ha common was reserved for future expansion, then divided into pasture lots. In 1820–1821, one of these lots measuring 0.8 ha plus a small adjoining parcel were granted to the Honourable William Johnston, Attorney General for Prince Edward Island, who had come from England in 1820.

above
Ravenwood House after first major renovations were completed (1914).

Ravenwood House built

At some point between 1820 and 1828, William Johnston, who died in 1828, ordered the construction of Ravenwood House; the exact date remains unknown. The main house, a two-storey wooden structure, measures 11 × 13.8 m. The foundation walls, skillfully matched, were built of Prince Edward Island red sandstone. All floor joists, rafters, and laths were hand hewn. Locks and other necessary hardware were brought from England. The clay used to make bricks for the chimney came from clay deposits on the Ravenwood property. The servants' quarters were located in the basement, where all cooking for the family was conducted. Also situated in the basement was a darkened chamber called "the dungeon," to which, it is said, unruly servants were sent.

The second occupant of Ravenwood House was Johnston's son-in-law, William Forgan, a lawyer and member of government in 1866. In 1873, when Prince Edward Island entered Confederation, the Honourable James C. Pope, Premier of Prince Edward Island, lived at Ravenwood House, where he kept a hop field and cricket garden. He also owned a local brewery. Over succeeding decades, other occupants of Ravenwood House included one of William Forgan's sons, Colonel Irving, and Mr. E. W. Taylor.

At the time of the acquisition of Ravenwood House by the federal government in 1909, a verandah surrounded three sides of the house. When the farm began, this was removed and bay windows were installed on the south side. At this time, the stately but dilapitated home contained 10 rooms, seven of which had fireplaces and several of these were equipped with marble mantlepieces. Today, only three fireplaces and two marble mantlepieces remain. In 1909–1910, while repairs were being made at Ravenwood House, Superintendent Artemus Clark lived in Charlottetown. The house was occupied by Artemus Clark from 1910 until his retirement in 1947, when Superintendent Robert Parent assumed residency. Extensive renovations were necessary, including major interior replastering. Robert Parent and his wife remained at Ravenwood House until 1961, when they moved into a home they had built in Charlottetown. Over the decades, Ravenwood House was used to accommodate visiting departmental staff, principally from Ottawa.

Dr. D. C. MacKay, Research Officer, occupied the house from 1961 to 1964. During 1964, the centennial of the first meeting held to discuss Confederation, Ravenwood House was furnished and used by the Prince Edward Island Centennial Committee to house prominent visitors to the province, and from December 1964 until April 1967 it was used as an administrative office and library for the farm.

Dr. Glen C. Russell, Director, (1966–1970) lived in Ravenwood House from 1967 until his transfer to Harrow in 1970. Dr. Lloyd B. MacLeod, who was appointed Director in February 1970, moved into Ravenwood House with his wife and three children in July 1970. At that time the interior of the house was tastefully redecorated and furnished. The occupancy of Ravenwood by station Superintendents and Directors has been distinguished by visits from friends, staff, members of the agricultural community, and the general public, who have enjoyed the opportunity to visit this historic residence.

above
Ravenwood House, c. 1960

CHAPTER 25

Tree plantings

In all likelihood, no other institution in Canada, with the exception of Government House in Ottawa, has had as many tree plantings by prominent individuals as has Charlottetown Research Station.

Superintendent Artemus Clark initiated a practice that brought a new dimension to the Charlottetown Experimental Farm—the ceremonial planting of trees by visiting royalty, governors general, and other prominent visitors.

The tree planting ceremonies on the front lawn of Ravenwood House had their beginning in July 1912, when the Duke of Connaught planted a tree during an official state visit to Prince Edward Island. Since the tradition began, all governors-general (with the exception of the Earl of Willingdon) have participated in official tree planting ceremonies at the station. Other prominent individuals to plant trees in the Royal Forest have included the then President of Agricultural Institute of Canada, Dr. F. J. Greaney, who visited Prince Edward Island for the Agricultural Institute's national convention in June 1950. In July 1950, Sir William Ogg, then Director of Britain's Rothamsted Experimental Farm, led a group of British scientists to Canada. Upon his arrival in Prince Edward Island, he planted an oak on the front lawn of Ravenwood House.

Several members of the Royal Family have planted trees on the lawn of Ravenwood House.

above left

Edward, Prince of Wales, planted an English oak in 1919. Here he stands on Superintendent Clark's right at the entrance to Ravenwood House.

left

Charles, Prince of Wales, planted an English oak in 1983. Here Diana, Princess of Wales (*left*), Mrs. Audrey MacLeod (*second from left*), and Dr. Lloyd MacLeod (*behind tree*) observe.

above

Princess Elizabeth, with Robert Parent, planted a seedling in 1951. The seedling was grown from an acorn taken from the English oak planted by her uncle, the Prince of Wales, in 1919.

Tree plantings by royal visitors

Without a doubt, the most prominent of all the individuals to plant trees at Ravenwood have been members of Britain's Royal Family, who have visited the station on several occasions. The first occurred in 1919 when Edward, Prince of Wales, planted an English oak in the presence of thousands of Prince Edward Islanders. The daily press at the time indicated that the City of Charlottetown was fully bedecked for the Prince's visit, following months of painstaking, anxious preparation. In 1951, Princess Elizabeth, accompanied by the Duke of Edinburgh, planted an English oak seedling from the tree her uncle planted in 1919. The facility which greeted them had grown much larger and more complex than the one which greeted the Prince of Wales 33 years earlier. The royal couple, escorted by Mr. and Mrs. Robert Parent, viewed a number of exhibits on the lawn of Ravenwood. Following tea in Ravenwood House, the Superintendent's residence, the royal couple asked to see the farm's livestock projects. They took great interest in various aspects of these studies, particularly those concerned with poultry and dairy production, two prominent areas of study at Charlottetown during that period.

Several other dignitaries have planted trees in the Royal Forest.

above left
The Earl of Bessborough, 1931

left
The Earl of Athlone, 1940

above right
Sir William Ogg, 1950

Governors-general of Canada have also planted trees on the lawn at Ravenwood House

below right
Viscount Alexander, 1946

Former Superintendents and Directors have planted trees.

above left

Dr. J. Artemus Clark

below left

Robert C. Parent

above right

Dr. Glen C. Russell

center right

The lower gate to the Experimental Farm as it appeared at the time of the royal visit in 1951.

below right

Queen Elizabeth and the Duke of Edinburgh visited the Research Station in 1973.

In 1973, on the occasion of the province's centennial celebration of its entry into Confederation, Queen Elizabeth and the Duke of Edinburgh, again visited the station, where they were greeted by Dr. and Mrs. Lloyd B. MacLeod and introduced to representatives of the Island's agricultural industry as well as to residents of Sherwood and Parkdale, P.E.I. While at the station, the royal couple viewed a number of research and agricultural exhibits and examined the tree the Queen had planted 20 years before.

In 1983, the station was again honored to receive members of Britain's Royal Family during an official state visit to Prince Edward Island. Charles and Diana, Prince and Princess of Wales were welcomed to the station by the Director, Dr. Lloyd B. MacLeod, and Mrs. MacLeod. Following in the tradition of their royal predecessors, the Prince planted an English oak in the Royal Forest. The couple then visited briefly in Ravenwood, viewed research station exhibits, and met many Island school children, boy scouts, girl guides, and senior citizens as well as members of the staff and general public during a walkabout on the front lawn of Ravenwood.

The tree planting custom started by Artemus Clark in 1912 and carried on by all succeeding Superintendents and Directors, is a popular custom, one which will, it is hoped, continue for many years.

above left

This display was prepared by station staff for the 1973 royal visit.

center

The royal couple took great interest in the golden spade, which has been used in tree planting ceremonies at the Research Station since 1912. Dr. Lloyd B. MacLeod (foreground).

below left

When Charles and Diana, Prince and Princess of Wales, visited the Research Station in 1983, they viewed exhibits manned by Winston Johnston (*left*) and Tapani Kunelius (*right*).

Trees planted on the lawn of Ravenwood House

PLANTED BY	DATE	TYPE OF TREE
Duke of Connaught	30 July 1912	American elm
H.R.H. Edward, Prince of Wales	19 August 1919	English oak
Duke of Devonshire	16 July 1920	Norway maple
Lady Byng	23 August 1923	English oak
Earl of Bessborough	5 October 1931	soft maple
Earl of Bessborough	27 July 1935	English elm
Lord Tweedsmuir	28 September 1937	Norway maple
Earl of Athlone	31 August 1940	soft maple
Duke of Kent	3 September 1941	soft maple
Viscount Alexander	23 September 1946	English oak
Dr. L. H. Newman	10 September 1947	small-leaved European linden
Dr. F. J. Greaney	27 June 1950	sugar maple
Sir William Ogg	10 July 1950	English oak
H.R.H. Princess Elizabeth	9 November 1951	English oak
Dr. J. Artemus Clark (Director, 1909–1947)	12 August 1952	Norway maple
Right Honourable Vincent Massey	28 August 1952	small-leaved European linden
Dr. E. S. Archibald	5 July 1956	schwedler maple
Lord Rowallan	10 November 1958	red maple
Right Honourable Major General George Vanier	19 July 1960	Norway maple
Dr. Maurice Lebel	7 June 1964	almey crab
Mr. Robert C. Parent (Superintendent, 1947–1966)	20 July 1966	paper birch
Right Honourable Roland Michener	7 September 1968	red maple
Dr. Glen C. Russell (Director, 1966–1970)	30 June 1972	Norway maple
Right Honourable Jules Leger	18 July 1975	red maple
Right Honourable Edward Schreyer	17 August 1979	Norway maple
H.R.H. Charles, Prince of Wales	27 June 1983	English oak

Tree planting site in centennial picnic–barbecue area

When the station's picnic–barbecue area was established in 1973 to mark Prince Edward Island's 100th anniversary, one section was chosen as a site where provincial and federal dignitaries could plant trees to mark special occasions.

Trees planted in the picnic-barbecue area

PLANTED BY	DATE	TYPE OF TREE
Mrs. Leone Ross (President, Prince Edward Island Women's Institute)	2 June 1973	Norway maple
Honourable Walter R. Shaw (Premier of Prince Edward Island, 16 September 1959–28 July 1966)	30 July 1979	Norway maple
Honourable Alexander B. Campbell (Premier of Prince Edward Island, 28 July 1966–18 September 1978)	30 July 1979	Norway maple
Honourable W. Bennett Campbell (Premier of Prince Edward Island, 18 September 1978–3 May 1979)	30 July 1979	Norway maple
Honourable J. Angus MacLean (Premier of Prince Edward Island, 3 May 1979–17 November 1981)	30 July 1979	Norway maple
Honourable James M. Lee (Premier of Prince Edward Island, 17 November 1981–)	27 June 1983	silver maple
Honourable Eugene F. Whelan (Minister, Agriculture Canada, 1972–1979, 1980–)	21 July 1983	crimson king maple

opposite page • left

Dr. Lloyd B. MacLeod (*left*) and the Honourable Gordon Bennett, Provincial Minister of Justice, officiated at the opening of the picnic–barbecue site in 1973. A cairn was unveiled to mark the occasion. The plaque on the cairn reads: "This Research Station Centennial Project is dedicated to greater cooperation within the agricultural community and to the betterment of agriculture and rural family life in P.E.I.

L. B. MacLeod
August 3, 1973"

opposite page • right

Premier Alec Campbell (P.E.I.) plants a Norway maple (1978).

right

The Honourable Eugene F. Whelan plants a crimson king maple (1983).

EPILOGUE

Charlottetown Research Station of 1984 bears little resemblance to the Charlottetown Experimental Farm of 1909. In 1909, the physical facilities and staff were sparse by comparison to those of 1984. The aims and objectives of the station, however, have not changed. Agriculture was a very important industry in Prince Edward Island in 1909—as it continues to be today.

Charlottetown Research Station has played an important role in the development of agriculture in Prince Edward Island and the Atlantic region, as evidenced by the many accomplishments enumerated in earlier sections of this history. The professional research staff identified by name throughout this history provided the initiative and leadership that resulted in the assessment of research needs, the carrying out of the research, and the promotion of the results. The unsung heroes of the Charlottetown Research Station, however, have been the support staff—technicians, clerks, secretaries, herdsmen, plotmen, summer students, librarians, stationary engineers, stenographers, and many others. Without the support of these many individuals, the station would not have achieved what it has, and it would not have the recognition and support it now enjoys. In 1984, there were about 80 full-time support staff; therefore it would be impossible to describe their specific work except to indicate that they were the ones who maintained the grounds, buildings, and equipment; conducted the laboratory greenhouse and field experiments; typed manuscripts; and so on. Their duties were often physically demanding, sometimes repetitious, often tedious, but always important.

The role played in agriculture by Charlottetown Research Station and its staff is expected to continue, but with changes in response to the specific needs of the industry. Scientists will continue to respond to the challenges that are expected to become more complex as Canada places greater emphasis on biotechnology, energy conservation, environmental protection including soil resource preservation, and food safety.

Changes in research can be expected—not in the objectives, but in how the objectives are achieved. Crop varieties, production techniques, and equipment have become obsolete as new varieties, techniques, and equipment are developed. The benefits provided to the industry by agricultural research have made it possible for farmers to produce more than their predecessors did. If this trend is to continue, much more will be expected of researchers and research establishments, including Charlottetown Research Station. As the station enters the final 25 years toward its centennial, its future is assured.

1. Fulton MacLaine
2. Neevin Clow
3. Lou McKenna
4. John Enman
5. Hans Nass
6. Barrie Stanfield
7. Archie Gillespie
8. Richard Martin
9. Martin Carter
10. Neil MacEwen
11. Hugh Rankin
12. David Grimmett
13. John MacLeod
14. Dick Sterling
15. Linnell Edwards
16. Karl Winter
17. Harold MacRae
18. Albert MacEwen
19. Brent MacKinnon
20. Mel White
21. Winston Johnston
22. Albert Stordy
23. Coleen Moore
24. Frederika Dunnewold
25. John Stewart
26. Roddy Pratt
27. Hector Arsenault
28. Harold Simpson
29. Mel Martin
30. Lane Sampson
31. Elaine Deadman
32. Lloyd MacLeod
33. Mary Bourdon
34. Jackie Hughes
35. Lloyd Kerry

above and opposite page
Staff, Charlottetown Research Station, 1984

1. Dean Read
2. Donnie Darrach
3. Lowell Farquharson
4. Niall Coulson
5. Jim Lund
6. Roy Boswall
7. Gerald McCarthy
8. Charlie Lund
9. Robert Sterling
10. David Carragher
11. David Younker
12. Leith Thompson
13. Michio Suzuki
14. Pushpal Narasimhalu
15. John McDonald
16. Ewen Stewart
17. Kevin Clow
18. Harold (Bud) Platt
19. Ian Macdonald
20. Ira Birt
21. Richard Reddin
22. Douglas Lea
23. Leonard Arsenault
24. Kevin Sanderson
25. Jack Cutcliffe
26. Janet McIsaac
27. Joe Kimpinski
28. Charlie Mutch
29. Wilfred Moase
30. Wayne Hogan
31. Murray Green
32. Bob Stevenson
33. Ray Peters
34. Charles Mullin
35. Jan Verhulp
36. Barrie Stevenson
37. Claude Gallant
38. Ambrose Malone
39. Charlie Duffy
40. Mary Smith
41. Tapani Kunelius
42. Walter Arsenault
43. Brian Sanderson
44. Alton Russell
45. Rollin Andrew
46. Margie Hooper
47. Carl Willis
48. Velma Campbell
49. Ron White
50. Jerry Ivany
51. Kathy MacIsaac

Bibliography

Canada Department of Agriculture. 1912. Guide to the experimental farms and stations for the Maritime Provinces.

Canada Department of Agriculture. 1922–1958. Illustration Station reports (incomplete).

Canada Department of Agriculture. 1930. The Dominion Experimental Farms.

Canada Department of Agriculture. Charlottetown Experimental Station. 1912. Daily journal; 1920. Time book; 1920–1960. Payroll books; 1920. Guide to the Experimental Station for Prince Edward Island; 1912–1922. Experimental Station reports; 1923–1957. Progress reports; 1959. 50th anniversary issue; 1968–1971. Research reports; 1971–1982. Research summaries.

Canada Department of Agriculture. 1967. Canada Agriculture: The first hundred years historical series No. 1.

Canadian Society of Technical Agriculturists. 1936–1937. Scientific agriculture, Vol. 17.

Department of Regional Economic Development. 1969. Development plan for Prince Edward Island.

Department of the Interior. 1930. Prince Edward Island: Its resources and opportunities.

Latimer, M. 1944. Economic survey of Prince Edward Island.

Whiteside, G. 1965. Soil survey of Prince Edward Island.

Agriculture Canada

RESEARCH STATION CHARLOTTETOWN

L B MacLEOD, Ph.D
DIRECTOR

L S THOMPSON, Ph D
HEAD OF SECTION
Insects (forage, cereal and potato)

J A MacLEOD, Ph.D.
HEAD OF SECTION
Nutrition (forage and cereal)

C B WILLIS, Ph.D
ASSISTANT DIRECTOR
Diseases (forage)

D A HUTCHINSON
ADMINISTRATIVE OFFICER

J A CUTCLIFFE, M Sc.
HEAD OF SECTION
Nutrition and management (vegetable)

CEREALS SECTION

A J CAMPBELL, B Eng
Engineering
(crop production)

M R CARTER, Ph.D
Soil Tillage

L M EDWARDS, Ph.D.
Soil Management

U C GUPTA, Ph D
Micronutrients
(soil and plant)

H W JOHNSTON, Ph.D
Diseases (cereal)

R A MARTIN, Ph.D.
Diseases (cereal)

H G NASS, Ph.D
Physiology (cereal)
Breeding (wheat)

J D E STERLING, M Sc.
Breeding (barley)

HORTICULTURE AND TOBACCO SECTION

W ARSENAULT, B Sc.(Agr)
Management and
Nutrition (tobacco)

J A IVANY, Ph.D
Weed control
(vegetable and
field crops)

J KIMPINSKI, Ph.D
Nematology

J G McDONALD, Ph.D
Virus diseases
(potato)

H W PLATT, Ph D
Diseases (potato
and vegetable)

D C READ, Ph.D
Pesticide degradation
Insects (vegetable)

J B SANDERSON, M Sc
Nutrition
(potato and vegetable)

R P. WHITE, Ph D
Nutrition
(potato and corn)
Soil chemistry

FORAGE/LIVESTOCK SECTION

R G ANDREW, B.Sc.
Agricultural
Economics

T M CHOO, Ph.D
Breeding
(red clover)

H T KUNELIUS, Ph.D.
Management (forage)

P NARASIMHALU, Ph.D.
Ouality and utilization
(forage)

M SUZUKI, Ph.D
Biochemistry
and physiology
(forage and cereal)

K.A. WINTER, Ph.D.
Nutrition
(animals)

J.R. ENMAN,
B.Sc. (Agr)
P.E.P. Biologist

M.B. BOURDON,
D. Journ.
INFORMATION OFFICER

B STANFIELD, M.L.S
LIBRARIAN

Appendix I

LAND TRANSACTIONS

Farm and original property name or location	Date	Terms	From/with/to	Area (ha)
HOME FARM				67.3
Additions				
Pope property	1909	Lease/Purchase*	Province of Prince Edward Island	11.9
Chandler property	1910	Lease/Purchase*	Province of Prince Edward Island	2.5
Gay property	1910	Lease/Purchase*	Province of Prince Edward Island	0.9
Blake property	1910	Lease/Purchase*	Province of Prince Edward Island	6.0
Johnson property (west)	1910	Lease/Purchase*	Province of Prince Edward Island	2.0
Johnson property (east)	1911–1912	Lease/Purchase*	Province of Prince Edward Island	2.8
Beer property	1911–1912	Lease/Purchase*	Province of Prince Edward Island	0.6
Johnson property	1912	Purchase	H. Johnson	4.9
Connolly estate	1912	Purchase	H. C. Connolly	2.4
H. C. Connolly lot	1912	Purchase	H. C. Connolly	2.4
Haszard lot	1912	Purchase	F. Haszard	2.4
St. Dunstan's lot	1912	Purchase	St. Dunstan's College	4.0
Blake property	1922	Purchase	Family of Maurice Blake	20.6
Connolly property	1924	Purchase	Henrietta Connolly	1.2
Fitzgerald lot	1926	Purchase	R. R. Fitzgerald	2.4
Mutch lot	1927	Purchase	G. A. Mutch	2.0
Pottery Lane	1950	Exchange**	Province of Prince Edward Island	1.5
Deletions				
Lot on University Avenue	1955	Transfer	Royal Canadian Mounted Police	0.8
Lot on University Avenue	1970	Transfer	Canadian Broadcasting Corporation	0.8
Lot on University Avenue	1974	Lease	Farm Centre Association	0.8
UPTON FARM				111.8
Upton Farm	1948	Purchase	Dr. J. Jenkins	66.8
Beach Grove Farm	1948	Purchase	Province of Prince Edward Island	24.3
Carter lot	1948	Purchase	E. E. Carter	0.4
Moore lot	1951	Purchase	J. A. Moore	0.3
Hurry Road Farm	1953	Purchase	R. J. Hurry	19.4
St. Dunstan's lot	1953	Purchase	St. Dunstan's College	0.6
HARRINGTON FARM				91.5
Connor property	1983	Purchase	Kirsten F. Connor	72.5
Holmes property	1983	Purchase	Albert Holmes	19.0

*In 1949 the original farm properties leased from the province of Prince Edward Island, with the exception of a 2.3-ha lot south of Allen Street and a 0.2-ha triangular parcel north of Allen Street, were purchased by the Dominion government for the Experimental Farm.

**Pottery Lane was obtained in exchange for 0.8 ha of land used to construct Belvedere Avenue.

Appendix II

ILLUSTRATION STATIONS

Supervisors	Dates
J. A. Clark	1923–1927
R. C. Parent	1927–1937
E. L. Eaton	1937–1939
W. N. Black	1940–1963*

Illustration Station Operator	Location	Dates
Queens County		
James E. Daly	Iona	1923–1952
John W. MacKenzie	Rose Valley	1923–1960
John L. Clark	Rustico	1924–1948
Alexander Matheson and Mrs. Sarah Matheson	Wood Islands	1927–1940
William E. Johnstone	New London	1928–1960
Hector MacKay	De Sable	1931–1940
Kings County		
Fred G. MacIntyre	Montague	1923–c. 1937
Clifford McEwen	St. Peters	1923–c. 1939
Nelson R. Stewart	Red Point	1927–c. 1937
T. Albert Hicken	Alliston	1935–1960**
Fred Cheverie	East Point	1937–c. 1945
Hugh J. MacDonald	Monticello	1947–1960**
Prince County		
R. E. Cadigan	Tignish	1923–1926
Cephus Gregg	West Devon	1923–1933
Thomas Noonan	Richmond	1924–1950
Alfred E. Gorrill and Mrs. G. McIsaac (wife of the late A. E. Gorrill)	Glenwood	1927–c.1945
Sylvain Peters	Palmer's Road	1927–c. 1945
Lester and Heber Profitt	Alberton	1936–1960**
Zenon Gallant	Urbainville	1945–1960**
Robert Woodside	O'Leary	1948–1960**
Magdalen Islands, Que.		
Edward Bouffard	Boisville	1953–1960
Alberic LaPierre	Portage du Cap	1953–1963

*L. M. Casserly was Acting Supervisor while W. N. Black served in the Royal Canadian Navy (1941–1945).
**Illustration Station contract ended in year shown, but operator cooperated with the Experimental Farm in agricultural experimentation and/or data collection for a period of time thereafter.

Appendix III

MILITARY SERVICE LISTS*

WORLD WAR I

H. Cannon
J. A. Clark
F. A. Driscoll
F. Gregory
I. Mitchell
G. C. Pickard
H. Riggs
D. M. Robinson
G. Robinson
A. Smith
J. Stentiford

WORLD WAR II

G. W. Ayers
I. D. Birt
W. N. Black
R. L. Boswall
R. B. Cameron
J. E. Campbell
H. Cannon
H. Craswell
S. E. Deacon
R. S. Dennis
A. Grant
F. Gregory
T. T. Hansen
T. Hunter
D. A. Hutchinson
A. C. MacEwen
R. B. MacLaren
S. MacLean
D. B. MacLeod
H. F. MacRae
C. E. Moore
C. T. Mullin
G. C. Pickard
G. J. Reynolds
D. B. Robinson
A. Rodd
S. A. Russell
H. Saunders
J. A. Shaw
H. A. Simpson
J. Sterns
R. Wood

*Includes Reserves, Veterans Guard, and so forth. Records specifying employee participation in the Canadian military or related functions were not kept; therefore this list is compiled from the recollections of former employees.

Appendix IV

EMPLOYEE LIST

Employees who are now in full-time positions or who have worked for 2 years, or more, at the Charlottetown Research Station* (Experimental Farm and Science Service Laboratory).

Directors

J. A. Clark, M.Sc.	1909–1947
R. C. Parent, M.Sc.	1947–1966
G. C. Russell, Ph.D.	1966–1970
L. B. MacLeod, Ph.D.	1970–

Professional Staff

R. G. Andrew, B.Sc. (Agr.)	1983–
W. J. Arsenault, B.Sc.(Agr.)	1981–
G. W. Ayers, M.Sc.	1937–1974
W. N. Black, B.Sc.	1938–1977
G. Boswall, M.Sc.	1949–1957
L. C. Callbeck, B.Sc.	1943–1976
A. J. Campbell, B.Eng.	1976–
J. E. Campbell, M.Sc.	1952–1966
F. M. Cannon, M.Sc.	1937–1970
M. R. Carter, Ph.D.	1983–
T. M. Choo, Ph.D.	1978–
K. S. Clough, Ph.D.	1976–1978
R. D. Crawford, Ph.D.	1957–1963
J. A. Cutcliffe, M.Sc.	1962–
E. L. Eaton, M.Sc.	1937–1940
L. M. Edwards, Ph.D.	1982–
J. R. Enman, B.Sc.(Agr.)	1983–
A. D. L. Gorrill, M.Sc.	1960–1966
U. C. Gupta, Ph.D.	1963–
R. R. Hurst, B.S.A.	1925–1961
J. A. Ivany, Ph.D.	1971–
H. W. Johnston, Ph.D.	1968–
J. Kimpinski, Ph.D.	1972–
H. T. Kunelius, Ph.D.	1970–
K. E. LeLacheur, B.Sc.	1952–1977
J. H. Lovering, Ph.D.	1970–1981
D. C. MacKay, Ph.D.	1961–1966
J. P. MacKinnon, M.Sc.	1973–1977
R. B. MacLaren	1950–1970
E. MacLeod, B.Sc.	1949–1953
J. A. MacLeod, Ph.D.	1971–
L. B. MacLeod, Ph.D.	1965–1970
R. A. Martin, Ph.D.	1980–
J. B. McCurry	1920–1923
J. G. McDonald, Ph.D.	1978–
F. L. McEwen, M.Sc.	1953–1955
D. C. Munro, M.Sc.	1959–1979
P. A. Murphy, Ph.D.	1915–1920
P. R. Narasimhalu, Ph.D.	1979–
H. G. Nass, Ph.D.	1970–
J. W. G. Nicholson, Ph.D.	1951–1961
R. C. Parent, M.Sc.	1927–1937
H. W. Platt, Ph.D.	1978–
D. C. Read, Ph.D.	1952–
D. B. Robinson, Ph.D.	1948–1961
D. G. Russell, Ph.D.	1973–1978
J. M. Sadler, Ph.D.	1976–1981
J. B. Sanderson, M.Sc.	1973–
D. C. Schurman, M.Sc.	1918–1952
J. D. E. Sterling, M.Sc.	1953–
A. B. Stevenson, B.Sc.	1951–1953
M. Suzuki, Ph.D.	1966–
L. S. Thompson, Ph.D.	1956–
B. F. Tinney, M.Sc.	1920–1958
G. C. Warren, B.Sc.	1919–1961
R. P. White, Ph.D.	1968–
G. B. Whiteside, B.Sc.	1950–1962
C. B. Willis, Ph.D.	1962–
K. A. Winter, Ph.D.	1968–

Administration

R. A. Baldwin	1936–1950
	1952–1973
L. Block	not available
M. B. Bourdon	1982–
E. M. Constable	1973–1976
G. Curley	not available
P. E. Deadman	1980–
F. Evans	c. 1947–1952
A. E. Farquharson	1967–
A. C. Fleming	1967–1971
A. J. Gorveatt	1967–1973
H. M. Hubley	1965–1967
J. D. Hughes	1980–
D. A. Hutchinson	1963–1967
	1971–
R. E. Kemp	1952–1973
M. Keir	not available
S. R. Knight	1977–1981
D. M. M. LeClair	1978–1980
J. C. MacDonald	1973–1978
K. N. MacKinnon	1964–1969
M. I. MacLellan	1937–1974
M. A. MacPhee	c. 1958–1965
M. Mitchell	not available
M. Murnaghan	1943–1958
M. E. Murphy	1973–1981
W. J. Phillips	1976–
N. Z. Pursey	1971–1980
E. Renton	1930–1936
S. A. Russell	1973–
B. A. Sampson	1970–1975
C. L. Sampson	1966–
C. Shaw	c. 1950–1957
B. Stanfield	1972–
E. Sterns	1918–1942
E. Stewart	1950–1959
E. J. Sutherland	not available
F. Tuplin	not available
F. Vessey	1959–1964
D. M. Williams	1934–1970

Technical, Trades, and Support

M. Andrew	not available
J. E. Arsenault	1936–1978
J. H. Arsenault	1954–
L. E. Arsenault	1952–
W. J. Arsenault	1973–1981
J. W. Baldwin	1949–1978
A. K. Ballem	1950–1977
I. D. Birt	1975–
A. J. Blanchard	1954–1974
C. Boelhouwer	1969–1974
P. B. Boettcher	1978–
R. L. Boswall	1955–
G. Brown	1918–1938
W. Burns	1928–1967
J. M. Caldwell	1978–1980
H. C. Callbeck	1920–1937
R. B. Cameron	1929–1977
V. M. Campbell	1981–
H. Cannon	1912–1914
V. Carmody	1948–1957
D. G. Carragher	1980–
E. N. Clow	1982–
K. F. Clow	1980–
B. D. Cobb	1976–1982
N. N. Coulson	1972–
C. D. Coulson	1974–1980
H. Craswell	1924–1930
R. Crawford	not available
J. A. Currie	1952–1983
D. S. Darrach	1981–
S. E. Deacon	1975–
T. L. DeHaan	1979–1982
R. S. Dennis	1961–1977
L. G. Dixon	1974–
F. A. Driscoll	1923–1949
C. P. Duffy	1956–
F. G. Dunnewold	1976–
J. R. Enman	1973–1983
J. R. Farquhar	1975–
E. L. Farquharson	1966–
A. C. Fenton	1982–
E. S. Francis	1972–1976
C. E. Gallant	1971–
S. J. Gallant	1964–1977
F. B. Gaudet	1943–1981
A. B. J. Gillespie	1980–
E. A. Gorveatte	1969–
A. Grant	1949–1959
M. J. Green	1970–
F. Gregory	c. 1920–1939
D. L. Grimmett	1965–
J. Hanna	c. 1920–1940
T. T. Hansen	1938–1976
R. Henry	not available
W. Hines	not available
K. Hof	1954–1979
W. P. Hogan	1982–
M. Hooper	1981–
J. L. Howatt	1925–1929
T. Hunter	1954–1984
A. Kelly	1937–not available
L. N. Kerry	1976–
D. G. Lea	1971–
G. Leclair	not available
J. Leclair	not available
G. G. Lewis	1943–

J. Lowrey	c. 1949–1955
C. W. Lund	1967–
E. I. Lund	1956–1975
J. E. Lund	1963–
P. W. Lund	1966–1976
I. K. Macdonald	1980–
R. MacDonald	1950–1982
M. MacEachern	1935–1965
A. C. MacEwen	1949–
H. D. MacEwen	1950–1973
J. MacEwen	c. 1930–not available
N. D. MacEwen	1960–
F. MacInnis	not available
W. MacInnis	1948–1961
K. A. MacIsaac	1982–
D. N. MacKenzie	1966–1979
B. B. MacKinnon	1969–
G. H. MacKinnon	1946–1973
H. F. MacLaine	1966–
R. B. MacLaren	1929–1950
D. S. MacLean	not available
R. F. MacLean	1924–1956
S. MacLean	c. 1950–not available
M. MacLennan	1911–1930
D. B. MacLeod	1947–1969
A. W. MacMicken	1964–
E. C. MacMillan	1939–1970
A. H. MacRae	1974–
H. F. MacRae	1948–
A. J. Malone	1982–
J. M. Martin	1973–
R. G. Matheson	1982–
S. McCabe	1949–1975
J. E. McCarthy	1973–1980
G. C. McCarthy	1975–
K. C. McDowell	1978–
J. G. McIsaac	1979–
L. F. McKenna	1961–
A. T. McNally	1971–1974
A. E. Mills	1965–1982
J. E. Mills	1970–1979
E. F. Misener	1974–1984
I. Mitchell	1930–1948
W. S. Moase	1980–
P. D. Monaghan	1976–
C. A. Moore	1982–
C. E. Moore	1949–1975
B. J. Morrissey	1964–1971
G. J. Morrissey	1955–1978
C. T. Mullin	1957–
D. C. Mutch	1970–
G. Mutlow	1958–1963
H. Newson	not available
J. Newson	not available
H. W. Parsons	1959–
J. Peters	c. 1920–1930
J. R. Peters	1945–
P. Peters	c. 1920–1930
G. C. Pickard	1948–1954
A. Polacko	c. 1960–not available
R. C. Pratt	1978–
G. Ralling	1977–1979
L. C. Ramsay	1948–1962
H. E. Rankin	1977–
R. D. Reddin	1977–
G. J. Reynolds	1949–1971
J. N. Richard	1948–1978
H. Riggs	not available
D. M. Robinson	not available
F. Robinson	c. 1920–1930
G. Robinson	c. 1920–1935
A. Rodd	1952–1955
F. Roper	1922–1934
S. J. Sampson	1974–1978
J. B. Sanderson	1971–1973
K. R. Sanderson	1975–
H. Saunders	not available
B. Shaw	1948–1977
J. A. Shaw	1960–1973
H. A. Simpson	1972–
A. Smith	1938–1965
J. Smith	c. 1920–1930
M. E. M. Smith	1980–
J. Spiers	1919–1921
J. E. Steele	1927–1977
J. Stentiford	c. 1940–not available
R. G. Sterling	1975–
J. Sterns	1950–1962
B. P. Stevenson	1966–
R. C. Stevenson	1966–
E. M. Stewart	1951–
F. Stewart	c. 1950–1954
J. D. Stewart	1957–
H. Storey	not available
A. A. Stordy	1976–
J. G. Tattrie	1973–1977
J. A. Thompson	1948–1971
W. Thompson	not available
W. S. Toole	1967–
J. Trainor	not available
J. Verhulp	1953–
J. L. Webb	1967–1978
M. D. D. White	1957–
J. C. Williams	1948–1976
A. Wisner	c. 1940–1950
B. Wood	c. 1950–not available
R. Wood	c. 1940–not available
M. E. Webber	1978–1981
A. Yates	c. 1925–1932
D. R. Younker	1980–

*Records for employees who left the station prior to 1963 are not complete. However, every effort has been made to list as many of these individuals as possible.